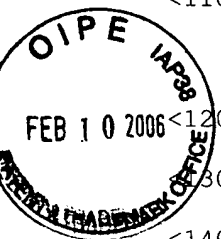


#  
 Rec'd PCT/PTO 10 FEB 2006

SEQUENCE LISTING



<110> Kuja-Panula, Juha  
 Kiiltomaki, Marjaana  
 Rauvala, Heikki

<120> NOVEL PROTEIN AND USES THEREOF

<130> 0933-0246PUS1

<140> US 10/537,102

<141> 2005-06-02

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<151> 2002-12-13

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<170> PatentIn version 3.3

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| atg | cac | ccc | cac | cgt | gac | ccg | aga | ggc | ctc | tgg | ctc | ctg | ctg | ccg | tcc | 48 |
| Met | His | Pro | His | Arg | Asp | Pro | Arg | Gly | Leu | Trp | Leu | Leu | Leu | Pro | Ser |    |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     |     | 15  |     |    |

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| ttg | tcc | ctg | ctg | ctt | ttt | gag | gtg | gcc | aga | gct | ggc | cga | gcc | gtg | gtt | 96 |
| Leu | Ser | Leu | Leu | Leu | Phe | Glu | Val | Ala | Arg | Ala | Gly | Arg | Ala | Val | Val |    |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |    |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| agc | tgt | cct | gcc | gcc | tgc | ttg | tgc | gcc | agc | aac | atc | ctc | agc | tgc | tcc | 144 |
| Ser | Cys | Pro | Ala | Ala | Cys | Leu | Cys | Ala | Ser | Asn | Ile | Leu | Ser | Cys | Ser |     |
|     |     | 35  |     |     |     | 40  |     |     |     |     |     | 45  |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| aag | cag | cag | ctg | ccc | aat | gtg | ccc | cat | tcc | ttg | ccc | agt | tac | aca | gca | 192 |
| Lys | Gln | Gln | Leu | Pro | Asn | Val | Pro | His | Ser | Leu | Pro | Ser | Tyr | Thr | Ala |     |
|     | 50  |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| cta | ctg | gac | ctc | agt | cac | aac | aac | ctg | agc | cgc | ctg | cgg | gcc | gag | tgg | 240 |
| Leu | Leu | Asp | Leu | Ser | His | Asn | Asn | Leu | Ser | Arg | Leu | Arg | Ala | Glu | Trp |     |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |     |

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| acc | ccc | acg | cgc | ctg | acc | caa | ctg | cac | tcc | ctg | ctg | ctg | agc | cac | aac | 288 |
| Thr | Pro | Thr | Arg | Leu | Thr | Gln | Leu | His | Ser | Leu | Leu | Leu | Ser | His | Asn |     |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| cac | ctg | aac | ttc | atc | tcc | tct | gag | gcc | ttt | tcc | ccg | gta | ccc | aac | ctg | 336 |
| His | Leu | Asn | Phe | Ile | Ser | Ser | Glu | Ala | Phe | Ser | Pro | Val | Pro | Asn | Leu |     |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| cg  | ta  | ct  | ga  | ct  | tc  | tc  | aa  | ca  | ct  | cg  | ac  | ct  | ga  | ga  | tt  | 384  |
| Arg | Tyr | Leu | Asp | Leu | Ser | Ser | Asn | Gln | Leu | Arg | Thr | Leu | Asp | Glu | Phe |      |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |      |
| ct  | tt  | ag  | ga  | ct  | ca  | gt  | ct  | ga  | gt  | ct  | ct  | ct  | ta  | aa  | aa  | 432  |
| Leu | Phe | Ser | Asp | Leu | Gln | Val | Leu | Glu | Val | Leu | Leu | Leu | Tyr | Asn | Asn |      |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |      |
| ca  | at  | at  | gc  | gt  | ga  | cg  | tg  | gc  | tt  | ga  | ga  | at  | gc  | ca  | ct  | 480  |
| His | Ile | Met | Ala | Val | Asp | Arg | Cys | Ala | Phe | Asp | Asp | Met | Ala | Gln | Leu |      |
|     | 145 |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |      |
| ca  | aa  | ct  | ta  | tt  | ag  | ca  | aa  | ca  | at  | tt  | cg  | tt  | cc  | ct  | ga  | 528  |
| Gln | Lys | Leu | Tyr | Leu | Ser | Gln | Asn | Gln | Ile | Ser | Arg | Phe | Pro | Leu | Glu |      |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |      |
| ct  | gt  | aa  | ga  | gg  | gc  | aa  | ct  | cc  | aa  | ct  | ac  | ct  | ct  | ga  | ct  | 576  |
| Leu | Val | Lys | Glu | Gly | Ala | Lys | Leu | Pro | Lys | Leu | Thr | Leu | Leu | Asp | Leu |      |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     |     | 190 |     |      |
| tt  | tt  | aa  | aa  | ct  | aa  | aa  | tt  | cc  | tt  | cc  | ga  | ct  | ca  | aa  | ct  | 624  |
| Ser | Ser | Asn | Lys | Leu | Lys | Asn | Leu | Pro | Leu | Pro | Asp | Leu | Gln | Lys | Leu |      |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |      |
| cc  | gc  | tg  | at  | aa  | aa  | gg  | ct  | ta  | ct  | aa  | aa  | cc  | cc  | ct  | aa  | 672  |
| Pro | Ala | Trp | Ile | Lys | Asn | Gly | Leu | Tyr | Leu | His | Asn | Asn | Pro | Leu | Asn |      |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |      |
| tg  | ga  | tg  | ga  | ct  | ta  | ca  | ct  | tt  | ta  | ca  | tg  | ca  | ta  | cg  | ca  | 720  |
| Cys | Asp | Cys | Glu | Leu | Tyr | Gln | Leu | Phe | Ser | His | Trp | Gln | Tyr | Arg | Gln |      |
|     | 225 |     |     |     |     | 230 |     |     |     | 235 |     |     |     |     | 240 |      |
| ct  | ag  | tc  | gt  | at  | ga  | tt  | ca  | ga  | ga  | ct  | ta  | tg  | at  | aa  | tc  | 768  |
| Leu | Ser | Ser | Val | Met | Asp | Phe | Gln | Glu | Asp | Leu | Tyr | Cys | Met | Asn | Ser |      |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |      |
| aa  | aa  | ct  | ca  | aa  | gt  | tt  | aa  | ct  | ag  | tt  | ct  | aa  | tg  | gg  | ga  | 816  |
| Lys | Lys | Leu | His | Asn | Val | Phe | Asn | Leu | Ser | Phe | Leu | Asn | Cys | Gly | Glu |      |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |      |
| ta  | aa  | ga  | cg  | gc  | tg  | ga  | gc  | ca  | ct  | gg  | ga  | ac  | tt  | at  | at  | 864  |
| Tyr | Lys | Glu | Arg | Ala | Trp | Glu | Ala | His | Leu | Gly | Asp | Thr | Leu | Ile | Ile |      |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |      |
| aa  | tg  | ga  | ac  | aa  | ca  | ca  | gg  | at  | ac  | aa  | gt  | tg  | gt  | aa  | cc  | 912  |
| Lys | Cys | Asp | Thr | Lys | Gln | Gln | Gly | Met | Thr | Lys | Val | Trp | Val | Thr | Pro |      |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |      |
| ag  | aa  | ga  | cg  | gt  | ct  | ga  | ga  | gt  | ac  | aa  | gg  | aa  | gt  | ag  | gt  | 960  |
| Ser | Asn | Glu | Arg | Val | Leu | Asp | Glu | Val | Thr | Asn | Gly | Thr | Val | Ser | Val |      |
|     | 305 |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |      |
| tt  | aa  | ga  | gg  | ag  | ct  | ct  | tt  | ca  | ca  | gt  | ca  | gt  | ga  | ga  | gg  | 1008 |
| Ser | Lys | Asp | Gly | Ser | Leu | Leu | Phe | Gln | Gln | Val | Gln | Val | Glu | Asp | Gly |      |
|     |     |     | 325 |     |     |     |     |     | 330 |     |     |     |     | 335 |     |      |

ggt gtg tat acc tgc tat gcc atg gga gag act ttc aat gag aca ctg 1056  
 Gly Val Tyr Thr Cys Tyr Ala Met Gly Glu Thr Phe Asn Glu Thr Leu  
 340 345 350

tct gtg gaa ttg aaa gtg cac aat ttc acc ttg cac gga cac cat gac 1104  
 Ser Val Glu Leu Lys Val His Asn Phe Thr Leu His Gly His His Asp  
 355 360 365

acc ctc aac aca gcc tat acc acc cta gtg ggc tgt atc ctt agt gtg 1152  
 Thr Leu Asn Thr Ala Tyr Thr Thr Leu Val Gly Cys Ile Leu Ser Val  
 370 375 380

gtc ctg gtc ctc ata tac cta tac ctc acc cct tgc cgc tgc tgg tgc 1200  
 Val Leu Val Leu Ile Tyr Leu Tyr Leu Thr Pro Cys Arg Cys Trp Cys  
 385 390 395 400

cgg ggt gta gag aag cct tcc agc cat caa gga gac agc ctc agc tct 1248  
 Arg Gly Val Glu Lys Pro Ser Ser His Gln Gly Asp Ser Leu Ser Ser  
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tcc atg ctt agt acc aca ccc aac cat gat cct atg gct ggt ggg gac 1296  
 Ser Met Leu Ser Thr Thr Pro Asn His Asp Pro Met Ala Gly Gly Asp  
 420 425 430

aaa gat gat ggt ttt gac cgg cgg gtg gct ttc ctg gaa cct gct gga 1344  
 Lys Asp Asp Gly Phe Asp Arg Arg Val Ala Phe Leu Glu Pro Ala Gly  
 435 440 445

cct ggg cag ggt caa aac ggc aag ctc aag cca ggc aac acc ctg cca 1392  
 Pro Gly Gln Gly Gln Asn Gly Lys Leu Lys Pro Gly Asn Thr Leu Pro  
 450 455 460

gtg cct gag gcc aca ggc aag ggc caa cgg agg atg tcg gat cca gaa 1440  
 Val Pro Glu Ala Thr Gly Lys Gly Gln Arg Arg Met Ser Asp Pro Glu  
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Ser Cys Pro Ala Ala Cys Leu Cys Ala Ser Asn Ile Leu Ser Cys Ser  
 35 40 45

Lys Gln Gln Leu Pro Asn Val Pro His Ser Leu Pro Ser Tyr Thr Ala

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Leu | Asp | Leu | Ser | His | Asn | Asn | Leu | Ser | Arg | Leu | Arg | Ala | Glu | Trp |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Thr | Pro | Thr | Arg | Leu | Thr | Gln | Leu | His | Ser | Leu | Leu | Leu | Ser | His | Asn |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| His | Leu | Asn | Phe | Ile | Ser | Ser | Glu | Ala | Phe | Ser | Pro | Val | Pro | Asn | Leu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Arg | Tyr | Leu | Asp | Leu | Ser | Ser | Asn | Gln | Leu | Arg | Thr | Leu | Asp | Glu | Phe |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Leu | Phe | Ser | Asp | Leu | Gln | Val | Leu | Glu | Val | Leu | Leu | Leu | Tyr | Asn | Asn |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| His | Ile | Met | Ala | Val | Asp | Arg | Cys | Ala | Phe | Asp | Asp | Met | Ala | Gln | Leu |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Gln | Lys | Leu | Tyr | Leu | Ser | Gln | Asn | Gln | Ile | Ser | Arg | Phe | Pro | Leu | Glu |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Leu | Val | Lys | Glu | Gly | Ala | Lys | Leu | Pro | Lys | Leu | Thr | Leu | Leu | Asp | Leu |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Ser | Ser | Asn | Lys | Leu | Lys | Asn | Leu | Pro | Leu | Pro | Asp | Leu | Gln | Lys | Leu |
|     |     |     | 195 |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Pro | Ala | Trp | Ile | Lys | Asn | Gly | Leu | Tyr | Leu | His | Asn | Asn | Pro | Leu | Asn |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Cys | Asp | Cys | Glu | Leu | Tyr | Gln | Leu | Phe | Ser | His | Trp | Gln | Tyr | Arg | Gln |
| 225 |     |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     | 240 |
| Leu | Ser | Ser | Val | Met | Asp | Phe | Gln | Glu | Asp | Leu | Tyr | Cys | Met | Asn | Ser |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Lys | Lys | Leu | His | Asn | Val | Phe | Asn | Leu | Ser | Phe | Leu | Asn | Cys | Gly | Glu |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Tyr | Lys | Glu | Arg | Ala | Trp | Glu | Ala | His | Leu | Gly | Asp | Thr | Leu | Ile | Ile |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Lys | Cys | Asp | Thr | Lys | Gln | Gln | Gly | Met | Thr | Lys | Val | Trp | Val | Thr | Pro |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Ser | Asn | Glu | Arg | Val | Leu | Asp | Glu | Val | Thr | Asn | Gly | Thr | Val | Ser | Val |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Ser | Lys | Asp | Gly | Ser | Leu | Leu | Phe | Gln | Gln | Val | Gln | Val | Glu | Asp | Gly |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Gly | Val | Tyr | Thr | Cys | Tyr | Ala | Met | Gly | Glu | Thr | Phe | Asn | Glu | Thr | Leu |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Ser | Val | Glu | Leu | Lys | Val | His | Asn | Phe | Thr | Leu | His | Gly | His | His | Asp |

|   |     |     |
|---|-----|-----|
| 355   | 360 | 365 |
| Thr Leu Asn Thr Ala Tyr Thr Thr Leu Val Gly Cys Ile Leu Ser Val |     |     |
| 370   | 375 | 380 |
| Val Leu Val Leu Ile Tyr Leu Tyr Leu Thr Pro Cys Arg Cys Trp Cys |     |     |
| 385   | 390 | 400 |
| Arg Gly Val Glu Lys Pro Ser Ser His Gln Gly Asp Ser Leu Ser Ser |     |     |
| 405   | 410 | 415 |
| Ser Met Leu Ser Thr Thr Pro Asn His Asp Pro Met Ala Gly Gly Asp |     |     |
| 420   | 425 | 430 |
| Lys Asp Asp Gly Phe Asp Arg Arg Val Ala Phe Leu Glu Pro Ala Gly |     |     |
| 435   | 440 | 445 |
| Pro Gly Gln Gly Gln Asn Gly Lys Leu Lys Pro Gly Asn Thr Leu Pro |     |     |
| 450   | 455 | 460 |
| Val Pro Glu Ala Thr Gly Lys Gly Gln Arg Arg Met Ser Asp Pro Glu |     |     |
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| Ser Val Ser Ser Val Phe Ser Asp Thr Pro Ile Val Val             |     |     |
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| aga ccg ggc tgc agg gag ctg ctg tgt ttg ctg atg atc aca gtg act            | 96  |
| Arg Pro Gly Cys Arg Glu Leu Leu Cys Leu Leu Met Ile Thr Val Thr            |     |
| 20                      25                      30                         |     |
| gtg ggc cct ggt gcc tct ggg gtg tgc ccc acc gct tgc atc tgt gcc            | 144 |
| Val Gly Pro Gly Ala Ser Gly Val Cys Pro Thr Ala Cys Ile Cys Ala            |     |
| 35                      40                      45                         |     |
| act gac atc gtc agc tgc acc aac aaa aac ctg tcc aag gtg cct ggg            | 192 |
| Thr Asp Ile Val Ser Cys Thr Asn Lys Asn Leu Ser Lys Val Pro Gly            |     |
| 50                      55                      60                         |     |
| aac ctt ttc aga ctg att aag aga ctg gac ctg agt tat aac aga att            | 240 |
| Asn Leu Phe Arg Leu Ile Lys Arg Leu Asp Leu Ser Tyr Asn Arg Ile            |     |
| 65                      70                      75                      80 |     |

|   |     |
|---|-----|
| ggg ctt ctg gat tct gag tgg att cca gta tcg ttt gca aag ctg aac | 288 |
| Gly Leu Leu Asp Ser Glu Trp Ile Pro Val Ser Phe Ala Lys Leu Asn |     |
| 85 90 95  |     |
| acc cta att ctt cgt cat aac aac atc acc agc att tcc acg ggc agt | 336 |
| Thr Leu Ile Leu Arg His Asn Asn Ile Thr Ser Ile Ser Thr Gly Ser |     |
| 100 105 110   |     |
| ttt tcc aca act cca aat ttg aag tgt ctt gac tta tcg tcc aat aag | 384 |
| Phe Ser Thr Thr Pro Asn Leu Lys Cys Leu Asp Leu Ser Ser Asn Lys |     |
| 115 120 125   |     |
| ctg aag acg gtg aaa aat gct gta ttc caa gag ttg aag gtt ctg gaa | 432 |
| Leu Lys Thr Val Lys Asn Ala Val Phe Gln Glu Leu Lys Val Leu Glu |     |
| 130 135 140   |     |
| gtg ctt ctg ctt tac aac aat cac ata tcc tat ctc gat cct tca gcg | 480 |
| Val Leu Leu Leu Tyr Asn Asn His Ile Ser Tyr Leu Asp Pro Ser Ala |     |
| 145 150 155 160   |     |
| ttt gga ggg ctc tcc cag ttg cag aaa ctc tac tta agt gga aat ttt | 528 |
| Phe Gly Gly Leu Ser Gln Leu Gln Lys Leu Tyr Leu Ser Gly Asn Phe |     |
| 165 170 175   |     |
| ctc aca cag ttt ccg atg gat ttg tat gtt gga agg ttc aag ctg gca | 576 |
| Leu Thr Gln Phe Pro Met Asp Leu Tyr Val Gly Arg Phe Lys Leu Ala |     |
| 180 185 190   |     |
| gaa ctg atg ttt tta gat gtt tct tat aac cga att cct tcc atg cca | 624 |
| Glu Leu Met Phe Leu Asp Val Ser Tyr Asn Arg Ile Pro Ser Met Pro |     |
| 195 200 205   |     |
| atg cac cac ata aat tta gtg cca gga aaa cag ctg aga ggc atc tac | 672 |
| Met His His Ile Asn Leu Val Pro Gly Lys Gln Leu Arg Gly Ile Tyr |     |
| 210 215 220   |     |
| ctt cat gga aac cca ttt gtc tgt gac tgt tcc ctg tac tcc ttg ctg | 720 |
| Leu His Gly Asn Pro Phe Val Cys Asp Cys Ser Leu Tyr Ser Leu Leu |     |
| 225 230 235 240   |     |
| gtc ttt tgg tat cgt agg cac ttt agc tca gtg atg gat ttt aag aac | 768 |
| Val Phe Trp Tyr Arg Arg His Phe Ser Ser Val Met Asp Phe Lys Asn |     |
| 245 250 255   |     |
| gat tac acc tgt cgc ctg tgg tct gac tcc agg cac tcg cgt cag gta | 816 |
| Asp Tyr Thr Cys Arg Leu Trp Ser Asp Ser Arg His Ser Arg Gln Val |     |
| 260 265 270   |     |
| ctt ctg ctc cag gat agc ttt atg aat tgc tct gac agc atc atc aat | 864 |
| Leu Leu Leu Gln Asp Ser Phe Met Asn Cys Ser Asp Ser Ile Ile Asn |     |
| 275 280 285   |     |
| ggg tcc ttt cgt gcg ctt ggc ttt att cat gag gct cag gtc ggg gaa | 912 |
| Gly Ser Phe Arg Ala Leu Gly Phe Ile His Glu Ala Gln Val Gly Glu |     |
| 290 295 300   |     |

|   |      |
|---|------|
| aga ctg atg gtc cac tgt gac agc aag aca ggt aat gca aat acg gat | 960  |
| Arg Leu Met Val His Cys Asp Ser Lys Thr Gly Asn Ala Asn Thr Asp |      |
| 305 310 315 320   |      |
| ttc atc tgg gtg ggt cca gat aac aga ctg cta gag ccg gat aaa gag | 1008 |
| Phe Ile Trp Val Gly Pro Asp Asn Arg Leu Leu Glu Pro Asp Lys Glu |      |
| 325 330 335   |      |
| atg gaa aac ttt tac gtg ttt cac aat gga agt ctg gtt ata gaa agc | 1056 |
| Met Glu Asn Phe Tyr Val Phe His Asn Gly Ser Leu Val Ile Glu Ser |      |
| 340 345 350   |      |
| cct cgt ttt gag gat gct gga gtg tat tct tgt atc gca atg aat aag | 1104 |
| Pro Arg Phe Glu Asp Ala Gly Val Tyr Ser Cys Ile Ala Met Asn Lys |      |
| 355 360 365   |      |
| caa cgc ctg tta aat gaa act gtg gac gtc aca ata aat gtg agc aat | 1152 |
| Gln Arg Leu Leu Asn Glu Thr Val Asp Val Thr Ile Asn Val Ser Asn |      |
| 370 375 380   |      |
| ttc act gta agc aga tcc cat gct cat gag gca ttt aac aca gct ttt | 1200 |
| Phe Thr Val Ser Arg Ser His Ala His Glu Ala Phe Asn Thr Ala Phe |      |
| 385 390 395 400   |      |
| acc act ctt gct gct tgc gtg gcc agt atc gtt ttg gta ctt ttg tac | 1248 |
| Thr Thr Leu Ala Ala Cys Val Ala Ser Ile Val Leu Val Leu Leu Tyr |      |
| 405 410 415   |      |
| ctc tat ctg act cca tgc ccc tgc aag tgt aaa acc aag aga cag aaa | 1296 |
| Leu Tyr Leu Thr Pro Cys Pro Cys Lys Cys Lys Thr Lys Arg Gln Lys |      |
| 420 425 430   |      |
| aat atg cta cac caa agc aat gcc cat tca tcg att ctc agt cct ggc | 1344 |
| Asn Met Leu His Gln Ser Asn Ala His Ser Ser Ile Leu Ser Pro Gly |      |
| 435 440 445   |      |
| ccc gct agt gat gcc tcc gct gat gaa cgg aag gca ggt gca ggt aaa | 1392 |
| Pro Ala Ser Asp Ala Ser Ala Asp Glu Arg Lys Ala Gly Ala Gly Lys |      |
| 450 455 460   |      |
| aga gtg gtg ttt ttg gaa ccc ctg aag gat act gca gca ggg cag aac | 1440 |
| Arg Val Val Phe Leu Glu Pro Leu Lys Asp Thr Ala Ala Gly Gln Asn |      |
| 465 470 475 480   |      |
| ggg aaa gtc agg ctc ttt ccc agc gag gca gtg ata gct gag ggc atc | 1488 |
| Gly Lys Val Arg Leu Phe Pro Ser Glu Ala Val Ile Ala Glu Gly Ile |      |
| 485 490 495   |      |
| cta aag tcc acg agg ggg aaa tct gac tca gat tca gtc aat tca gtg | 1536 |
| Leu Lys Ser Thr Arg Gly Lys Ser Asp Ser Asp Ser Val Asn Ser Val |      |
| 500 505 510   |      |
| ttt tct gac aca cct ttt gtg gcg tcc act                         | 1566 |
| Phe Ser Asp Thr Pro Phe Val Ala Ser Thr                         |      |
| 515 520   |      |

|       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| <400> | 4   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
| Met   | Ser | Leu | Arg | Val | His | Thr | Leu | Pro | Thr | Leu | Leu | Gly | Ala | Val | Val |  |
| 1     |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |  |
| Arg   | Pro | Gly | Cys | Arg | Glu | Leu | Leu | Cys | Leu | Leu | Met | Ile | Thr | Val | Thr |  |
|       |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |  |
| Val   | Gly | Pro | Gly | Ala | Ser | Gly | Val | Cys | Pro | Thr | Ala | Cys | Ile | Cys | Ala |  |
|       |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |  |
| Thr   | Asp | Ile | Val | Ser | Cys | Thr | Asn | Lys | Asn | Leu | Ser | Lys | Val | Pro | Gly |  |
|       | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |  |
| Asn   | Leu | Phe | Arg | Leu | Ile | Lys | Arg | Leu | Asp | Leu | Ser | Tyr | Asn | Arg | Ile |  |
| 65    |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |  |
| Gly   | Leu | Leu | Asp | Ser | Glu | Trp | Ile | Pro | Val | Ser | Phe | Ala | Lys | Leu | Asn |  |
|       |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |  |
| Thr   | Leu | Ile | Leu | Arg | His | Asn | Asn | Ile | Thr | Ser | Ile | Ser | Thr | Gly | Ser |  |
|       |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |  |
| Phe   | Ser | Thr | Thr | Pro | Asn | Leu | Lys | Cys | Leu | Asp | Leu | Ser | Ser | Asn | Lys |  |
|       |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |  |
| Leu   | Lys | Thr | Val | Lys | Asn | Ala | Val | Phe | Gln | Glu | Leu | Lys | Val | Leu | Glu |  |
|       | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |  |
| Val   | Leu | Leu | Leu | Tyr | Asn | Asn | His | Ile | Ser | Tyr | Leu | Asp | Pro | Ser | Ala |  |
| 145   |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |  |
| Phe   | Gly | Gly | Leu | Ser | Gln | Leu | Gln | Lys | Leu | Tyr | Leu | Ser | Gly | Asn | Phe |  |
|       |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |  |
| Leu   | Thr | Gln | Phe | Pro | Met | Asp | Leu | Tyr | Val | Gly | Arg | Phe | Lys | Leu | Ala |  |
|       |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |  |
| Glu   | Leu | Met | Phe | Leu | Asp | Val | Ser | Tyr | Asn | Arg | Ile | Pro | Ser | Met | Pro |  |
|       |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |  |
| Met   | His | His | Ile | Asn | Leu | Val | Pro | Gly | Lys | Gln | Leu | Arg | Gly | Ile | Tyr |  |
|       | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |  |
| Leu   | His | Gly | Asn | Pro | Phe | Val | Cys | Asp | Cys | Ser | Leu | Tyr | Ser | Leu | Leu |  |
| 225   |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Val   | Phe | Trp | Tyr | Arg | Arg | His | Phe | Ser | Ser | Val | Met | Asp | Phe | Lys | Asn |  |
|       |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |  |
| Asp   | Tyr | Thr | Cys | Arg | Leu | Trp | Ser | Asp | Ser | Arg | His | Ser | Arg | Gln | Val |  |
|       |     |     | 260 |     |     |     |     | 265 |     |     |     |     |     | 270 |     |  |



Leu Leu Leu Gln Asp Ser Phe Met Asn Cys Ser Asp Ser Ile Ile Asn  
 275 280 285  
 Gly Ser Phe Arg Ala Leu Gly Phe Ile His Glu Ala Gln Val Gly Glu  
 290 295 300  
 Arg Leu Met Val His Cys Asp Ser Lys Thr Gly Asn Ala Asn Thr Asp  
 305 310 315 320  
 Phe Ile Trp Val Gly Pro Asp Asn Arg Leu Leu Glu Pro Asp Lys Glu  
 325 330 335  
 Met Glu Asn Phe Tyr Val Phe His Asn Gly Ser Leu Val Ile Glu Ser  
 340 345 350  
 Pro Arg Phe Glu Asp Ala Gly Val Tyr Ser Cys Ile Ala Met Asn Lys  
 355 360 365  
 Gln Arg Leu Leu Asn Glu Thr Val Asp Val Thr Ile Asn Val Ser Asn  
 370 375 380  
 Phe Thr Val Ser Arg Ser His Ala His Glu Ala Phe Asn Thr Ala Phe  
 385 390 395 400  
 Thr Thr Leu Ala Ala Cys Val Ala Ser Ile Val Leu Val Leu Leu Tyr  
 405 410 415  
 Leu Tyr Leu Thr Pro Cys Pro Cys Lys Cys Lys Thr Lys Arg Gln Lys  
 420 425 430  
 Asn Met Leu His Gln Ser Asn Ala His Ser Ser Ile Leu Ser Pro Gly  
 435 440 445  
 Pro Ala Ser Asp Ala Ser Ala Asp Glu Arg Lys Ala Gly Ala Gly Lys  
 450 455 460  
 Arg Val Val Phe Leu Glu Pro Leu Lys Asp Thr Ala Ala Gly Gln Asn  
 465 470 475 480  
 Gly Lys Val Arg Leu Phe Pro Ser Glu Ala Val Ile Ala Glu Gly Ile  
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 Phe Ser Asp Thr Pro Phe Val Ala Ser Thr  
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<222> (1)..(1512)

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| Met Thr Trp Leu Val Leu Leu Gly Thr Leu Leu Cys Met Leu Arg Val |     |
| 1 5 10 15   |     |
| ggg tta ggc acc ccg gac tcc gag ggt ttc ccg ccc cgt gcg ctc cac | 96  |
| Gly Leu Gly Thr Pro Asp Ser Glu Gly Phe Pro Pro Arg Ala Leu His |     |
| 20 25 30  |     |
| aac tgc ccc tac aaa tgt atc tgc gct gcc gac ctg cta agc tgc act | 144 |
| Asn Cys Pro Tyr Lys Cys Ile Cys Ala Ala Asp Leu Leu Ser Cys Thr |     |
| 35 40 45  |     |
| ggc cta ggg ctg cag gac gtg cca gcc gag tta cct gcc gct act gcg | 192 |
| Gly Leu Gly Leu Gln Asp Val Pro Ala Glu Leu Pro Ala Ala Thr Ala |     |
| 50 55 60  |     |
| gac ctc gac ctg agc cac aac gcg ctc cag cgc ctg cgc ccc ggc tgg | 240 |
| Asp Leu Asp Leu Ser His Asn Ala Leu Gln Arg Leu Arg Pro Gly Trp |     |
| 65 70 75 80   |     |
| ttg gcg ccc ctc ttc cag ctg cgc gcc ctg cac cta gac cac aac gaa | 288 |
| Leu Ala Pro Leu Phe Gln Leu Arg Ala Leu His Leu Asp His Asn Glu |     |
| 85 90 95  |     |
| cta gat gcg ctg ggt cgc ggc gtc ttc gtc aac gcc agc ggc ctg agg | 336 |
| Leu Asp Ala Leu Gly Arg Gly Val Phe Val Asn Ala Ser Gly Leu Arg |     |
| 100 105 110   |     |
| ctg ctc gat cta tca tct aac acg ttg cgg gcg ctt ggc cgc cac gac | 384 |
| Leu Leu Asp Leu Ser Ser Asn Thr Leu Arg Ala Leu Gly Arg His Asp |     |
| 115 120 125   |     |
| ctc gac ggg ctg ggg gcg ctg gag aag ctg ctt ctg ttc aat aac cgc | 432 |
| Leu Asp Gly Leu Gly Ala Leu Glu Lys Leu Leu Leu Phe Asn Asn Arg |     |
| 130 135 140   |     |
| ttg gtg cac ttg gac gag cat gcc ttc cac ggc ctg cgc gcg ctc agc | 480 |
| Leu Val His Leu Asp Glu His Ala Phe His Gly Leu Arg Ala Leu Ser |     |
| 145 150 155 160   |     |
| cat ctc tac ctg ggc tgc aac gaa ctc gcc tcg ttc tcc ttc gac cac | 528 |
| His Leu Tyr Leu Gly Cys Asn Glu Leu Ala Ser Phe Ser Phe Asp His |     |
| 165 170 175   |     |
| ctg cac ggt ctg agc gcc acc cac ctg ctt act ctg gac ctc tcc tcc | 576 |
| Leu His Gly Leu Ser Ala Thr His Leu Leu Thr Leu Asp Leu Ser Ser |     |
| 180 185 190   |     |
| aac cgg ctg gga cac atc tcc gta cct gag ctg gcc gcg ctg ccg gcc | 624 |
| Asn Arg Leu Gly His Ile Ser Val Pro Glu Leu Ala Ala Leu Pro Ala |     |
| 195 200 205   |     |
| ttc ctc aag aac ggc ctc tac ttg cac aac aac cct ttg cct tgc gac | 672 |
| Phe Leu Lys Asn Gly Leu Tyr Leu His Asn Asn Pro Leu Pro Cys Asp |     |

| 210   | 215 | 220 |      |
|---|-----|-----|------|
| tgc cgc ctc tac cac ctg cta cag cgc tgg cac cag cgg ggc ctg agc<br>Cys Arg Leu Tyr His Leu Leu Gln Arg Trp His Gln Arg Gly Leu Ser<br>225 230 235 240 |     |     | 720  |
| gcc gtg cgc gac ttt gcg cgc gag tac gta tgc ttg gcc ttc aag gta<br>Ala Val Arg Asp Phe Ala Arg Glu Tyr Val Cys Leu Ala Phe Lys Val<br>245 250 255     |     |     | 768  |
| ccc gcg tcc cgc gtg cgc ttc ttc cag cac agc cgc gtc ttt gag aac<br>Pro Ala Ser Arg Val Arg Phe Phe Gln His Ser Arg Val Phe Glu Asn<br>260 265 270     |     |     | 816  |
| tgc tcg tcg gcc cca gct ctt ggc cta gag cgg ccg gaa gag cac ctg<br>Cys Ser Ser Ala Pro Ala Leu Gly Leu Glu Arg Pro Glu Glu His Leu<br>275 280 285     |     |     | 864  |
| tac gcg ctg gtg ggt cgg tcc ctg agg ctt tac tgc aac acc agc gtc<br>Tyr Ala Leu Val Gly Arg Ser Leu Arg Leu Tyr Cys Asn Thr Ser Val<br>290 295 300     |     |     | 912  |
| ccg gcc atg cgc att gcc tgg gtt tcg ccg cag cag gag ctt ctc agg<br>Pro Ala Met Arg Ile Ala Trp Val Ser Pro Gln Gln Glu Leu Leu Arg<br>305 310 315 320 |     |     | 960  |
| gcg cca gga tcc cgc gat ggc agc atc gcg gtg ctg gcc gac ggc agc<br>Ala Pro Gly Ser Arg Asp Gly Ser Ile Ala Val Leu Ala Asp Gly Ser<br>325 330 335     |     |     | 1008 |
| ttg gcc ata ggc aac gta cag gag cag cat gcg gga ctc ttc gtg tgc<br>Leu Ala Ile Gly Asn Val Gln Glu Gln His Ala Gly Leu Phe Val Cys<br>340 345 350     |     |     | 1056 |
| ctg gcc act ggg ccc cgc ctg cac cac aac cag acg cac gag tac aac<br>Leu Ala Thr Gly Pro Arg Leu His His Asn Gln Thr His Glu Tyr Asn<br>355 360 365     |     |     | 1104 |
| gtg agc gtg cac ttt ccg cgc cca gag ccc gag gct ttc aac aca ggc<br>Val Ser Val His Phe Pro Arg Pro Glu Pro Glu Ala Phe Asn Thr Gly<br>370 375 380     |     |     | 1152 |
| ttc acc aca ctg ctg ggc tgt gcc gtg ggc ctt gtg ctc gtg ctg ctc<br>Phe Thr Thr Leu Leu Gly Cys Ala Val Gly Leu Val Leu Val Leu Leu<br>385 390 395 400 |     |     | 1200 |
| tac ctg ttc gcc cca ccc tgc cgc tgc tgc cgc cgt gcc tgc cgc tgc<br>Tyr Leu Phe Ala Pro Pro Cys Arg Cys Cys Arg Arg Ala Cys Arg Cys<br>405 410 415     |     |     | 1248 |
| cgc cgc tgg ccc caa aca ccc agc ccg ctc caa gag ctg agc gca cag<br>Arg Arg Trp Pro Gln Thr Pro Ser Pro Leu Gln Glu Leu Ser Ala Gln<br>420 425 430     |     |     | 1296 |
| tcc tca gta ctc agc acc aca ccg cca gac gca ccc agc cgc aag gcc<br>Ser Ser Val Leu Ser Thr Thr Pro Pro Asp Ala Pro Ser Arg Lys Ala<br>435 440 445     |     |     | 1344 |

agc gtc cac aag cac gta gtc ttt ctg gag cca ggc cgg agg ggc ctc 1392  
 Ser Val His Lys His Val Val Phe Leu Glu Pro Gly Arg Arg Gly Leu  
 450 455 460

aat ggc cgc gtg cag ctg gca gta gct gag gaa ttc gat ctc tac aac 1440  
 Asn Gly Arg Val Gln Leu Ala Val Ala Glu Glu Phe Asp Leu Tyr Asn  
 465 470 475 480

cct gga ggc ctg cag ctg aag gct ggc tct gag tcc gcc agc tcc ata 1488  
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 485 490 495

ggc tcc gag ggt ccc atg aca acc 1512  
 Gly Ser Glu Gly Pro Met Thr Thr  
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Asn Cys Pro Tyr Lys Cys Ile Cys Ala Ala Asp Leu Leu Ser Cys Thr  
 35 40 45

Gly Leu Gly Leu Gln Asp Val Pro Ala Glu Leu Pro Ala Ala Thr Ala  
 50 55 60

Asp Leu Asp Leu Ser His Asn Ala Leu Gln Arg Leu Arg Pro Gly Trp  
 65 70 75 80

Leu Ala Pro Leu Phe Gln Leu Arg Ala Leu His Leu Asp His Asn Glu  
 85 90 95

Leu Asp Ala Leu Gly Arg Gly Val Phe Val Asn Ala Ser Gly Leu Arg  
 100 105 110

Leu Leu Asp Leu Ser Ser Asn Thr Leu Arg Ala Leu Gly Arg His Asp  
 115 120 125

Leu Asp Gly Leu Gly Ala Leu Glu Lys Leu Leu Leu Phe Asn Asn Arg  
 130 135 140

Leu Val His Leu Asp Glu His Ala Phe His Gly Leu Arg Ala Leu Ser  
 145 150 155 160

His Leu Tyr Leu Gly Cys Asn Glu Leu Ala Ser Phe Ser Phe Asp His  
 165 170 175

Leu His Gly Leu Ser Ala Thr His Leu Leu Thr Leu Asp Leu Ser Ser  
 180 185 190  
 Asn Arg Leu Gly His Ile Ser Val Pro Glu Leu Ala Ala Leu Pro Ala  
 195 200 205  
 Phe Leu Lys Asn Gly Leu Tyr Leu His Asn Asn Pro Leu Pro Cys Asp  
 210 215 220  
 Cys Arg Leu Tyr His Leu Leu Gln Arg Trp His Gln Arg Gly Leu Ser  
 225 230 235 240  
 Ala Val Arg Asp Phe Ala Arg Glu Tyr Val Cys Leu Ala Phe Lys Val  
 245 250 255  
 Pro Ala Ser Arg Val Arg Phe Phe Gln His Ser Arg Val Phe Glu Asn  
 260 265 270  
 Cys Ser Ser Ala Pro Ala Leu Gly Leu Glu Arg Pro Glu Glu His Leu  
 275 280 285  
 Tyr Ala Leu Val Gly Arg Ser Leu Arg Leu Tyr Cys Asn Thr Ser Val  
 290 295 300  
 Pro Ala Met Arg Ile Ala Trp Val Ser Pro Gln Gln Glu Leu Leu Arg  
 305 310 315 320  
 Ala Pro Gly Ser Arg Asp Gly Ser Ile Ala Val Leu Ala Asp Gly Ser  
 325 330 335  
 Leu Ala Ile Gly Asn Val Gln Glu Gln His Ala Gly Leu Phe Val Cys  
 340 345 350  
 Leu Ala Thr Gly Pro Arg Leu His His Asn Gln Thr His Glu Tyr Asn  
 355 360 365  
 Val Ser Val His Phe Pro Arg Pro Glu Pro Glu Ala Phe Asn Thr Gly  
 370 375 380  
 Phe Thr Thr Leu Leu Gly Cys Ala Val Gly Leu Val Leu Val Leu Leu  
 385 390 395 400  
 Tyr Leu Phe Ala Pro Pro Cys Arg Cys Cys Arg Arg Ala Cys Arg Cys  
 405 410 415  
 Arg Arg Trp Pro Gln Thr Pro Ser Pro Leu Gln Glu Leu Ser Ala Gln  
 420 425 430  
 Ser Ser Val Leu Ser Thr Thr Pro Pro Asp Ala Pro Ser Arg Lys Ala  
 435 440 445  
 Ser Val His Lys His Val Val Phe Leu Glu Pro Gly Arg Arg Gly Leu  
 450 455 460  
 Asn Gly Arg Val Gln Leu Ala Val Ala Glu Glu Phe Asp Leu Tyr Asn  
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Pro Gly Gly Leu Gln Leu Lys Ala Gly Ser Glu Ser Ala Ser Ser Ile  
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Gly Ser Glu Gly Pro Met Thr Thr  
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<211> 1827

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protein

<220>

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<222> (1)..(1827)

<400> 7

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| atg | caa | ccc | cag | cgt | gac | ctg | cga | ggc | ctc | tgg | ctc | ctg | ctg | ctc | tcc | 48 |
| Met | Gln | Pro | Gln | Arg | Asp | Leu | Arg | Gly | Leu | Trp | Leu | Leu | Leu | Leu | Ser |    |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     |     | 15  |     |    |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| gtg | ttc | ctg | ctt | ctc | ttt | gag | gta | gcc | agg | gcc | ggc | cga | tct | gtg | gtt | 96 |
| Val | Phe | Leu | Leu | Leu | Phe | Glu | Val | Ala | Arg | Ala | Gly | Arg | Ser | Val | Val |    |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |    |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| agt | tgt | ccc | gcc | aac | tgc | ctg | tgc | gcc | agc | aac | atc | ctc | agc | tgc | tcc | 144 |
| Ser | Cys | Pro | Ala | Asn | Cys | Leu | Cys | Ala | Ser | Asn | Ile | Leu | Ser | Cys | Ser |     |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| aag | cag | cag | ctg | ccc | aat | gtg | ccc | caa | tct | ttg | ccc | agc | tac | aca | gca | 192 |
| Lys | Gln | Gln | Leu | Pro | Asn | Val | Pro | Gln | Ser | Leu | Pro | Ser | Tyr | Thr | Ala |     |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |     |

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ctg | ctg | gac | ctc | agc | cac | aac | aac | ttg | agc | agg | ctg | cgg | gcc | gag | tgg | 240 |
| Leu | Leu | Asp | Leu | Ser | His | Asn | Asn | Leu | Ser | Arg | Leu | Arg | Ala | Glu | Trp |     |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| acc | ccc | acc | cgg | ctg | acc | aac | ctg | cac | tcc | ctg | ctg | ctg | agc | cac | aac | 288 |
| Thr | Pro | Thr | Arg | Leu | Thr | Asn | Leu | His | Ser | Leu | Leu | Leu | Ser | His | Asn |     |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| cac | ctg | aac | ttc | atc | tcc | tcc | gag | gcc | ttc | gtc | ccc | gta | ccc | aac | ctt | 336 |
| His | Leu | Asn | Phe | Ile | Ser | Ser | Glu | Ala | Phe | Val | Pro | Val | Pro | Asn | Leu |     |
|     |     | 100 |     |     |     |     |     | 105 |     |     |     |     | 110 |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| agg | tac | ttg | gac | ctc | tcc | tcc | aac | cat | ctt | cac | acg | ctg | gat | gag | ttc | 384 |
| Arg | Tyr | Leu | Asp | Leu | Ser | Ser | Asn | His | Leu | His | Thr | Leu | Asp | Glu | Phe |     |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ctg | ttc | agc | gac | ctg | cag | gcg | ctg | gaa | gtg | ctg | ttg | ctc | tac | aat | aac | 432 |
| Leu | Phe | Ser | Asp | Leu | Gln | Ala | Leu | Glu | Val | Leu | Leu | Leu | Tyr | Asn | Asn |     |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |     |

|   |      |
|---|------|
| cac att gtg gtg gtg gac cgg aat gcc ttt gag gac atg gcc cag ctg | 480  |
| His Ile Val Val Val Asp Arg Asn Ala Phe Glu Asp Met Ala Gln Leu |      |
| 145 150 155 160   |      |
| cag aaa ctc tac tta agc cag aat cag atc tct cgc ttt cct gtg gaa | 528  |
| Gln Lys Leu Tyr Leu Ser Gln Asn Gln Ile Ser Arg Phe Pro Val Glu |      |
| 165 170 175   |      |
| ctg atc aag gat ggg aac aaa tta ccc aaa ctg atg ctc ttg gat ctg | 576  |
| Leu Ile Lys Asp Gly Asn Lys Leu Pro Lys Leu Met Leu Leu Asp Leu |      |
| 180 185 190   |      |
| tcc tcc aac aag ctg aag aag ttg ccc ctg act gac ctg cag aaa ttg | 624  |
| Ser Ser Asn Lys Leu Lys Lys Leu Pro Leu Thr Asp Leu Gln Lys Leu |      |
| 195 200 205   |      |
| cca gcc tgg gtc aag aat ggg cta tac ctg cat aac aac ccc ttg gag | 672  |
| Pro Ala Trp Val Lys Asn Gly Leu Tyr Leu His Asn Asn Pro Leu Glu |      |
| 210 215 220   |      |
| tgc gac tgc aag ctc tac cag ctc ttt tcg cac tgg cag tac cgg cag | 720  |
| Cys Asp Cys Lys Leu Tyr Gln Leu Phe Ser His Trp Gln Tyr Arg Gln |      |
| 225 230 235 240   |      |
| ctg agc tct gtg atg gac ttc cag gag gac ctg tac tgc atg cac tcc | 768  |
| Leu Ser Ser Val Met Asp Phe Gln Glu Asp Leu Tyr Cys Met His Ser |      |
| 245 250 255   |      |
| aag aag ctg cac aac atc ttc agc ctg gat ttc ttc aat tgc agc gag | 816  |
| Lys Lys Leu His Asn Ile Phe Ser Leu Asp Phe Phe Asn Cys Ser Glu |      |
| 260 265 270   |      |
| tac aag gaa agt gcc tgg gag gct cac ctg gga gac acc ttg acc atc | 864  |
| Tyr Lys Glu Ser Ala Trp Glu Ala His Leu Gly Asp Thr Leu Thr Ile |      |
| 275 280 285   |      |
| agg tgt gac acc aaa cag caa ggc atg acc aaa gtg tgg gtg tcc cca | 912  |
| Arg Cys Asp Thr Lys Gln Gln Gly Met Thr Lys Val Trp Val Ser Pro |      |
| 290 295 300   |      |
| agc aat gaa cag gtg cta agt cag ggg tcc aat ggc tcg gtg agc gtg | 960  |
| Ser Asn Glu Gln Val Leu Ser Gln Gly Ser Asn Gly Ser Val Ser Val |      |
| 305 310 315 320   |      |
| agg aat ggc gac ctt ttt ttt aaa aag gtg cag gtc gag gat ggg ggt | 1008 |
| Arg Asn Gly Asp Leu Phe Phe Lys Lys Val Gln Val Glu Asp Gly Gly |      |
| 325 330 335   |      |
| gtg tat acc tgt tac gcc atg ggg gag act ttc aac gag aca ctg tct | 1056 |
| Val Tyr Thr Cys Tyr Ala Met Gly Glu Thr Phe Asn Glu Thr Leu Ser |      |
| 340 345 350   |      |
| gtg gag ttg aaa gtg tat aac ttc acc ttg cac gga cac cat gac acc | 1104 |
| Val Glu Leu Lys Val Tyr Asn Phe Thr Leu His Gly His His Asp Thr |      |
| 355 360 365   |      |

|   |      |
|---|------|
| ctc aac gga tcc gag gtg ctg ttc cag ggc ccc aaa tct tgt gac aaa | 1152 |
| Leu Asn Gly Ser Glu Val Leu Phe Gln Gly Pro Lys Ser Cys Asp Lys |      |
| 370 375 380   |      |
| act cac aca tgc cca ccg tgc cca gca cct gaa ctc ctg ggg gga ccg | 1200 |
| Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro |      |
| 385 390 395 400   |      |
| tca gtc ttc ctc ttc ccc cca aaa ccc aag gac acc ctc atg atc tcc | 1248 |
| Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser |      |
| 405 410 415   |      |
| cgg acc cct gag gtg aca tgc gtg gtg gtg gac gtg agc cac gaa gac | 1296 |
| Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp |      |
| 420 425 430   |      |
| cct gag gtc aag ttc aac tgg tac gtg gac ggc gtg gag gtg cat aat | 1344 |
| Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn |      |
| 435 440 445   |      |
| gcc aag aca aag ccg cgg gag gag cag tac aac agc acg tac cgg gtg | 1392 |
| Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val |      |
| 450 455 460   |      |
| gtc agc gtc ctc acc gtc ctg cac cag gac tgg ctg aat ggc aag gag | 1440 |
| Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu |      |
| 465 470 475 480   |      |
| tac aag tgc aag gtc tcc aac aaa gcc ctc cca gcc ccc atc gag aaa | 1488 |
| Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys |      |
| 485 490 495   |      |
| acc atc tcc aaa gcc aaa ggg cag ccc cga gaa cca cag gtg tac acc | 1536 |
| Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr |      |
| 500 505 510   |      |
| ctg ccc cca tcc cgg gat gag ctg acc aag aac cag gtc agc ctg acc | 1584 |
| Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr |      |
| 515 520 525   |      |
| tgc ctg gtc aaa ggc ttc tat ccc agc gac atc gcc gtg gag tgg gag | 1632 |
| Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu |      |
| 530 535 540   |      |
| agc aat ggg cag ccg gag aac aac tac aag acc acg cct ccc gtg ctg | 1680 |
| Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu |      |
| 545 550 555 560   |      |
| gac tcc gac ggc tcc ttc ttc ctc tac agc aag ctc acc gtg gac aag | 1728 |
| Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys |      |
| 565 570 575   |      |
| agc agg tgg cag cag ggg aac gtc ttc tca tgc tcc gtg atg cat gag | 1776 |
| Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu |      |
| 580 585 590   |      |
| gct ctg cac aac cac tac acg cag aag agc ctc tcc ctg tct ccg ggt | 1824 |



Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly  
 595 600 605

aaa  
 Lys

1827

<210> 8  
 <211> 609  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Ig-fusion  
 protein

<400> 8  
 Met Gln Pro Gln Arg Asp Leu Arg Gly Leu Trp Leu Leu Leu Leu Ser  
 1 5 10 15  
 Val Phe Leu Leu Leu Phe Glu Val Ala Arg Ala Gly Arg Ser Val Val  
 20 25 30  
 Ser Cys Pro Ala Asn Cys Leu Cys Ala Ser Asn Ile Leu Ser Cys Ser  
 35 40 45  
 Lys Gln Gln Leu Pro Asn Val Pro Gln Ser Leu Pro Ser Tyr Thr Ala  
 50 55 60  
 Leu Leu Asp Leu Ser His Asn Asn Leu Ser Arg Leu Arg Ala Glu Trp  
 65 70 75 80  
 Thr Pro Thr Arg Leu Thr Asn Leu His Ser Leu Leu Leu Ser His Asn  
 85 90 95  
 His Leu Asn Phe Ile Ser Ser Glu Ala Phe Val Pro Val Pro Asn Leu  
 100 105 110  
 Arg Tyr Leu Asp Leu Ser Ser Asn His Leu His Thr Leu Asp Glu Phe  
 115 120 125  
 Leu Phe Ser Asp Leu Gln Ala Leu Glu Val Leu Leu Leu Tyr Asn Asn  
 130 135 140  
 His Ile Val Val Val Asp Arg Asn Ala Phe Glu Asp Met Ala Gln Leu  
 145 150 155 160  
 Gln Lys Leu Tyr Leu Ser Gln Asn Gln Ile Ser Arg Phe Pro Val Glu  
 165 170 175  
 Leu Ile Lys Asp Gly Asn Lys Leu Pro Lys Leu Met Leu Leu Asp Leu  
 180 185 190  
 Ser Ser Asn Lys Leu Lys Lys Leu Pro Leu Thr Asp Leu Gln Lys Leu  
 195 200 205  
 Pro Ala Trp Val Lys Asn Gly Leu Tyr Leu His Asn Asn Pro Leu Glu

| 210  | 215 | 220 |
|--|-----|-----|
| Cys Asp Cys Lys Leu Tyr Gln Leu Phe Ser His Trp Gln Tyr Arg Gln<br>225 230 235 240 |     |     |
| Leu Ser Ser Val Met Asp Phe Gln Glu Asp Leu Tyr Cys Met His Ser<br>245 250 255     |     |     |
| Lys Lys Leu His Asn Ile Phe Ser Leu Asp Phe Phe Asn Cys Ser Glu<br>260 265 270     |     |     |
| Tyr Lys Glu Ser Ala Trp Glu Ala His Leu Gly Asp Thr Leu Thr Ile<br>275 280 285     |     |     |
| Arg Cys Asp Thr Lys Gln Gln Gly Met Thr Lys Val Trp Val Ser Pro<br>290 295 300     |     |     |
| Ser Asn Glu Gln Val Leu Ser Gln Gly Ser Asn Gly Ser Val Ser Val<br>305 310 315 320 |     |     |
| Arg Asn Gly Asp Leu Phe Phe Lys Lys Val Gln Val Glu Asp Gly Gly<br>325 330 335     |     |     |
| Val Tyr Thr Cys Tyr Ala Met Gly Glu Thr Phe Asn Glu Thr Leu Ser<br>340 345 350     |     |     |
| Val Glu Leu Lys Val Tyr Asn Phe Thr Leu His Gly His His Asp Thr<br>355 360 365     |     |     |
| Leu Asn Gly Ser Glu Val Leu Phe Gln Gly Pro Lys Ser Cys Asp Lys<br>370 375 380     |     |     |
| Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro<br>385 390 395 400 |     |     |
| Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser<br>405 410 415     |     |     |
| Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp<br>420 425 430     |     |     |
| Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn<br>435 440 445     |     |     |
| Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val<br>450 455 460     |     |     |
| Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu<br>465 470 475 480 |     |     |
| Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys<br>485 490 495     |     |     |
| Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr<br>500 505 510     |     |     |
| Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr                    |     |     |

|   |     |         |
|---|-----|---------|
| 515   | 520 | 525     |
| Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu |     |         |
| 530   | 535 | 540     |
| Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu |     |         |
| 545   | 550 | 555 560 |
| Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys |     |         |
|   | 565 | 570 575 |
| Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu |     |         |
|   | 580 | 585 590 |
| Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly |     |         |
|   | 595 | 600 605 |

Lys

<210> 9  
 <211> 1920  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Ig-fusion protein

<220>  
 <221> CDS  
 <222> (1)..(1920)

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|---|-----|
| <400> 9   |     |
| atg tcg tta agg ttc cac aca ctg ccc acc ctg cct aga gct gtc aaa | 48  |
| Met Ser Leu Arg Phe His Thr Leu Pro Thr Leu Pro Arg Ala Val Lys |     |
| 1 5 10 15   |     |
| ccg ggt tgc aga gag ctg ctg tgt ctg ttg gtg atc gca gtg atg gtg | 96  |
| Pro Gly Cys Arg Glu Leu Leu Cys Leu Leu Val Ile Ala Val Met Val |     |
| 20 25 30  |     |
| agc ccc agc gcc tca gga atg tgc ccc act gct tgc atc tgt gcc acc | 144 |
| Ser Pro Ser Ala Ser Gly Met Cys Pro Thr Ala Cys Ile Cys Ala Thr |     |
| 35 40 45  |     |
| gac att gtc agc tgc acc aac aaa aac cta tct aag gtg ccc ggg aac | 192 |
| Asp Ile Val Ser Cys Thr Asn Lys Asn Leu Ser Lys Val Pro Gly Asn |     |
| 50 55 60  |     |
| ctt ttc aga ctg att aaa aga ctg gat ctg agc tat aac aga atc gga | 240 |
| Leu Phe Arg Leu Ile Lys Arg Leu Asp Leu Ser Tyr Asn Arg Ile Gly |     |
| 65 70 75 80   |     |
| ctg ttg gat gcc gac tgg atc ccg gtg tcg ttt gtc aag ctg agc acc | 288 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Leu | Leu | Asp | Ala | Asp | Trp | Ile | Pro | Val | Ser | Phe | Val | Lys | Leu | Ser | Thr |     |  |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |     |  |
| tta | att | ctt | cgc | cac | aac | aac | atc | acc | agc | atc | tcc | acg | ggc | agt | ttc | 336 |  |
| Leu | Ile | Leu | Arg | His | Asn | Asn | Ile | Thr | Ser | Ile | Ser | Thr | Gly | Ser | Phe |     |  |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |     |  |
| tcc | aca | acc | cca | aat | tta | aag | tgt | ctg | gac | tta | tca | tcc | aat | agg | ctg | 384 |  |
| Ser | Thr | Thr | Pro | Asn | Leu | Lys | Cys | Leu | Asp | Leu | Ser | Ser | Asn | Arg | Leu |     |  |
|     |     |     | 115 |     |     |     | 120 |     |     |     |     | 125 |     |     |     |     |  |
| aag | tcg | gta | aag | agt | gcc | aca | ttc | caa | gag | ctg | aag | gct | ctg | gaa | gta | 432 |  |
| Lys | Ser | Val | Lys | Ser | Ala | Thr | Phe | Gln | Glu | Leu | Lys | Ala | Leu | Glu | Val |     |  |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |     |  |
| ctg | ctg | ctg | tac | aac | aac | cac | att | tcc | tat | ctg | gac | ccc | gca | gcg | ttc | 480 |  |
| Leu | Leu | Leu | Tyr | Asn | Asn | His | Ile | Ser | Tyr | Leu | Asp | Pro | Ala | Ala | Phe |     |  |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |     |  |
| ggg | ggg | ctt | tcc | cac | ttg | cag | aaa | ctc | tat | ctg | agt | ggg | aac | ttt | ctc | 528 |  |
| Gly | Gly | Leu | Ser | His | Leu | Gln | Lys | Leu | Tyr | Leu | Ser | Gly | Asn | Phe | Leu |     |  |
|     |     |     |     | 165 |     |     |     | 170 |     |     |     |     |     | 175 |     |     |  |
| aca | cag | ttc | cct | atg | gat | ttg | tat | act | ggg | agg | ttc | aag | ctg | gct | gat | 576 |  |
| Thr | Gln | Phe | Pro | Met | Asp | Leu | Tyr | Thr | Gly | Arg | Phe | Lys | Leu | Ala | Asp |     |  |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |  |
| ctg | aca | ttt | tta | gat | gtt | tcc | tat | aat | cga | atc | cct | tcc | ata | ccg | atg | 624 |  |
| Leu | Thr | Phe | Leu | Asp | Val | Ser | Tyr | Asn | Arg | Ile | Pro | Ser | Ile | Pro | Met |     |  |
|     | 195 |     |     |     |     | 200 |     |     |     |     |     | 205 |     |     |     |     |  |
| cac | cat | ata | aac | tta | gtg | ccg | ggg | aga | cag | ctg | aga | ggc | atc | tac | ctt | 672 |  |
| His | His | Ile | Asn | Leu | Val | Pro | Gly | Arg | Gln | Leu | Arg | Gly | Ile | Tyr | Leu |     |  |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |     |  |
| cac | ggg | aac | cca | ttt | gta | tgt | gac | tgt | tct | ctg | tac | tcg | ttg | ctg | atc | 720 |  |
| His | Gly | Asn | Pro | Phe | Val | Cys | Asp | Cys | Ser | Leu | Tyr | Ser | Leu | Leu | Ile |     |  |
| 225 |     |     |     |     | 230 |     |     |     | 235 |     |     |     |     |     | 240 |     |  |
| ttt | tgg | tac | cgt | agg | cac | ttt | agc | tcc | gtg | atg | gat | ttt | aag | aat | gac | 768 |  |
| Phe | Trp | Tyr | Arg | Arg | His | Phe | Ser | Ser | Val | Met | Asp | Phe | Lys | Asn | Asp |     |  |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     |     | 255 |     |     |  |
| tat | acc | tgt | cgc | ctg | tgg | tct | gac | tcc | agg | cac | tcc | cac | cag | ctg | cag | 816 |  |
| Tyr | Thr | Cys | Arg | Leu | Trp | Ser | Asp | Ser | Arg | His | Ser | His | Gln | Leu | Gln |     |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |     |  |
| ctg | ctc | cag | gag | agc | ttt | ctg | aac | tgt | tct | tac | agc | gtt | atc | aac | ggc | 864 |  |
| Leu | Leu | Gln | Glu | Ser | Phe | Leu | Asn | Cys | Ser | Tyr | Ser | Val | Ile | Asn | Gly |     |  |
|     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |     |     |  |
| tcc | ttc | cac | gca | ctt | ggc | ttt | atc | cac | gag | gct | cag | gtt | ggg | gag | agg | 912 |  |
| Ser | Phe | His | Ala | Leu | Gly | Phe | Ile | His | Glu | Ala | Gln | Val | Gly | Glu | Arg |     |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |     |  |
| gcg | atc | gtc | cac | tgt | gac | agc | aag | act | ggc | aat | gga | aat | act | gat | ttc | 960 |  |
| Ala | Ile | Val | His | Cys | Asp | Ser | Lys | Thr | Gly | Asn | Gly | Asn | Thr | Asp | Phe |     |  |

| 305   | 310 | 315 | 320 |      |
|---|-----|-----|-----|------|
| atc tgg gtc ggt ccc gat aac agg ctg ctg gag cca gat aaa gac atg |     |     |     | 1008 |
| Ile Trp Val Gly Pro Asp Asn Arg Leu Leu Glu Pro Asp Lys Asp Met | 325 | 330 | 335 |      |
| ggg aac ttt cgt gtg ttt tac aac gga agt ctg gtc ata gag aac cct |     |     |     | 1056 |
| Gly Asn Phe Arg Val Phe Tyr Asn Gly Ser Leu Val Ile Glu Asn Pro | 340 | 345 | 350 |      |
| ggc ttt gag gac gcc ggg gta tat tct tgt atc gca atg aac agg cag |     |     |     | 1104 |
| Gly Phe Glu Asp Ala Gly Val Tyr Ser Cys Ile Ala Met Asn Arg Gln | 355 | 360 | 365 |      |
| cgg ctg tta aac gag acg gtg gat atc atg atc aac gtg agc aat ttc |     |     |     | 1152 |
| Arg Leu Leu Asn Glu Thr Val Asp Ile Met Ile Asn Val Ser Asn Phe | 370 | 375 | 380 |      |
| acc ata aac aga tcc cac gcc cac gag gcg gcg gcc gcg gat ccc atc |     |     |     | 1200 |
| Thr Ile Asn Arg Ser His Ala His Glu Ala Ala Ala Asp Pro Ile     | 385 | 390 | 395 | 400  |
| gaa ggt cgt ggt ggt ggt ggt ggt gat ccc aaa tct tgt gac aaa cct |     |     |     | 1248 |
| Glu Gly Arg Gly Gly Gly Gly Gly Asp Pro Lys Ser Cys Asp Lys Pro | 405 | 410 | 415 |      |
| cac aca tgc cca ccg tgc cca gca cct gaa ctc ctg ggg gga ccg tca |     |     |     | 1296 |
| His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser | 420 | 425 | 430 |      |
| gtc ttc ctc ttc ccc cca aaa ccc aag gac acc ctc atg atc tcc cgg |     |     |     | 1344 |
| Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg | 435 | 440 | 445 |      |
| acc cct gag gtc aca tgc gtg gtg gtg gac gtg agc cac gaa gac cct |     |     |     | 1392 |
| Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro | 450 | 455 | 460 |      |
| gag gtc aag ttc aac tgg tac gtg gac ggc gtg gag gtg cat aat gcc |     |     |     | 1440 |
| Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala | 465 | 470 | 475 | 480  |
| aag aca aag ccg cgg gag gag cag tac aac agc acg tac cgg gtg gtc |     |     |     | 1488 |
| Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val | 485 | 490 | 495 |      |
| agc gtc ctc acc gtc ctg cac cag gac tgg ctg aat ggc aag gag tac |     |     |     | 1536 |
| Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr | 500 | 505 | 510 |      |
| aag tgc aag gtc tcc aac aaa gcc ctc cca gcc ccc atc gag aaa acc |     |     |     | 1584 |
| Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr | 515 | 520 | 525 |      |
| atc tcc aaa gcc aaa ggg cag ccc cga gaa cca cag gtg tac acc ctg |     |     |     | 1632 |
| Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu | 530 | 535 | 540 |      |

|   |      |
|---|------|
| ccc cca tcc cgg gat gag ctg acc aag aac cag gtc agc ctg acc tgc | 1680 |
| Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys |      |
| 545 550 555 560   |      |
|   |      |
| ctg gtc aaa ggc ttc tat ccc agc gac atc gcc gtg gag tgg gag agc | 1728 |
| Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser |      |
| 565 570 575   |      |
|   |      |
| aat ggg cag ccg gag aac aac tac aag acc acg cct ccc gtg ctg gac | 1776 |
| Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp |      |
| 580 585 590   |      |
|   |      |
| tcc gac ggc tcc ttc ttc ctc tac agc aag ctc acc gtg gac aag agc | 1824 |
| Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser |      |
| 595 600 605   |      |
|   |      |
| agg tgg cag cag ggg aac gtc ttc tca tgc tcc gtg atg cat gag gct | 1872 |
| Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala |      |
| 610 615 620   |      |
|   |      |
| ctg cac aac cac tac acg cag aag agc ctc tcc ctg tct ccg ggt aaa | 1920 |
| Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys |      |
| 625 630 635 640   |      |

<210> 10

<211> 640

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Ig-fusion  
protein

<400> 10

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ser | Leu | Arg | Phe | His | Thr | Leu | Pro | Thr | Leu | Pro | Arg | Ala | Val | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Gly | Cys | Arg | Glu | Leu | Leu | Cys | Leu | Leu | Val | Ile | Ala | Val | Met | Val |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Pro | Ser | Ala | Ser | Gly | Met | Cys | Pro | Thr | Ala | Cys | Ile | Cys | Ala | Thr |
|     |     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Ile | Val | Ser | Cys | Thr | Asn | Lys | Asn | Leu | Ser | Lys | Val | Pro | Gly | Asn |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Phe | Arg | Leu | Ile | Lys | Arg | Leu | Asp | Leu | Ser | Tyr | Asn | Arg | Ile | Gly |
|     | 65  |     |     |     | 70  |     |     |     | 75  |     |     |     |     |     | 80  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Leu | Asp | Ala | Asp | Trp | Ile | Pro | Val | Ser | Phe | Val | Lys | Leu | Ser | Thr |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Ile | Leu | Arg | His | Asn | Asn | Ile | Thr | Ser | Ile | Ser | Thr | Gly | Ser | Phe |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |

Ser Thr Thr Pro Asn Leu Lys Cys Leu Asp Leu Ser Ser Asn Arg Leu  
 115 120 125  
 Lys Ser Val Lys Ser Ala Thr Phe Gln Glu Leu Lys Ala Leu Glu Val  
 130 135 140  
 Leu Leu Leu Tyr Asn Asn His Ile Ser Tyr Leu Asp Pro Ala Ala Phe  
 145 150 155 160  
 Gly Gly Leu Ser His Leu Gln Lys Leu Tyr Leu Ser Gly Asn Phe Leu  
 165 170 175  
 Thr Gln Phe Pro Met Asp Leu Tyr Thr Gly Arg Phe Lys Leu Ala Asp  
 180 185 190  
 Leu Thr Phe Leu Asp Val Ser Tyr Asn Arg Ile Pro Ser Ile Pro Met  
 195 200 205  
 His His Ile Asn Leu Val Pro Gly Arg Gln Leu Arg Gly Ile Tyr Leu  
 210 215 220  
 His Gly Asn Pro Phe Val Cys Asp Cys Ser Leu Tyr Ser Leu Leu Ile  
 225 230 235 240  
 Phe Trp Tyr Arg Arg His Phe Ser Ser Val Met Asp Phe Lys Asn Asp  
 245 250 255  
 Tyr Thr Cys Arg Leu Trp Ser Asp Ser Arg His Ser His Gln Leu Gln  
 260 265 270  
 Leu Leu Gln Glu Ser Phe Leu Asn Cys Ser Tyr Ser Val Ile Asn Gly  
 275 280 285  
 Ser Phe His Ala Leu Gly Phe Ile His Glu Ala Gln Val Gly Glu Arg  
 290 295 300  
 Ala Ile Val His Cys Asp Ser Lys Thr Gly Asn Gly Asn Thr Asp Phe  
 305 310 315 320  
 Ile Trp Val Gly Pro Asp Asn Arg Leu Leu Glu Pro Asp Lys Asp Met  
 325 330 335  
 Gly Asn Phe Arg Val Phe Tyr Asn Gly Ser Leu Val Ile Glu Asn Pro  
 340 345 350  
 Gly Phe Glu Asp Ala Gly Val Tyr Ser Cys Ile Ala Met Asn Arg Gln  
 355 360 365  
 Arg Leu Leu Asn Glu Thr Val Asp Ile Met Ile Asn Val Ser Asn Phe  
 370 375 380  
 Thr Ile Asn Arg Ser His Ala His Glu Ala Ala Ala Ala Asp Pro Ile  
 385 390 395 400  
 Glu Gly Arg Gly Gly Gly Gly Gly Asp Pro Lys Ser Cys Asp Lys Pro  
 405 410 415

His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser  
 420 425 430  
 Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg  
 435 440 445  
 Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro  
 450 455 460  
 Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala  
 465 470 475 480  
 Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val  
 485 490 495  
 Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr  
 500 505 510  
 Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr  
 515 520 525  
 Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu  
 530 535 540  
 Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys  
 545 550 555 560  
 Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser  
 565 570 575  
 Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp  
 580 585 590  
 Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser  
 595 600 605  
 Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala  
 610 615 620  
 Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys  
 625 630 635 640

<210> 11

<211> 1887

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Ig-fusion protein

<220>

<221> CDS

<222> (1)..(1887)



<400> 11

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| Met Ala Trp Leu Val Leu Ser Gly Ile Leu Leu Cys Met Leu Gly Ala |     |
| 1 5 10 15   |     |
| gga ttg ggc act tca gac ttg gag gat gtt ctg cct cct gct ccc cac | 96  |
| Gly Leu Gly Thr Ser Asp Leu Glu Asp Val Leu Pro Pro Ala Pro His |     |
| 20 25 30  |     |
| aac tgc ccc gat ata tgc atc tgt gct gcc gat gtg ttg agc tgt gcg | 144 |
| Asn Cys Pro Asp Ile Cys Ile Cys Ala Ala Asp Val Leu Ser Cys Ala |     |
| 35 40 45  |     |
| ggc cgt ggg tta cag gac ttg ccg gta gca ctg cct acc act gct gca | 192 |
| Gly Arg Gly Leu Gln Asp Leu Pro Val Ala Leu Pro Thr Thr Ala Ala |     |
| 50 55 60  |     |
| gaa ctc gat ttg agc cac aac gca ctc aaa cgc ctg cac ccg ggg tgg | 240 |
| Glu Leu Asp Leu Ser His Asn Ala Leu Lys Arg Leu His Pro Gly Trp |     |
| 65 70 75 80   |     |
| tta gcg ccc ctc tcc cgg ctg cgt gcc ttg cac cta ggc tat aat aag | 288 |
| Leu Ala Pro Leu Ser Arg Leu Arg Ala Leu His Leu Gly Tyr Asn Lys |     |
| 85 90 95  |     |
| ctg gaa gtc ctg ggc cat ggt gcg ttc acc aat gcc agt ggc ctg agg | 336 |
| Leu Glu Val Leu Gly His Gly Ala Phe Thr Asn Ala Ser Gly Leu Arg |     |
| 100 105 110   |     |
| aca ctt gac ctg tcc tct aat atg tta agg atg ctc cat acc cat gac | 384 |
| Thr Leu Asp Leu Ser Ser Asn Met Leu Arg Met Leu His Thr His Asp |     |
| 115 120 125   |     |
| ctg gat ggc ctg gag gag ctg gag aag tta ctt ctg ttc aat aac agc | 432 |
| Leu Asp Gly Leu Glu Glu Leu Glu Lys Leu Leu Leu Phe Asn Asn Ser |     |
| 130 135 140   |     |
| ctg atg cac ttg gac ctg gat gcc ttc cag ggc ctg cgc atg ctt agc | 480 |
| Leu Met His Leu Asp Leu Asp Ala Phe Gln Gly Leu Arg Met Leu Ser |     |
| 145 150 155 160   |     |
| cac ctc tat ctc agc tgc aac gag ctc tcc tct ttc tct ttc aac cac | 528 |
| His Leu Tyr Leu Ser Cys Asn Glu Leu Ser Ser Phe Ser Phe Asn His |     |
| 165 170 175   |     |
| ttg cac ggt ctg ggg tta acc cgc ctg cgg act ctg gac ctc tcc tcc | 576 |
| Leu His Gly Leu Gly Leu Thr Arg Leu Arg Thr Leu Asp Leu Ser Ser |     |
| 180 185 190   |     |
| aac tgg ctg aaa cat atc tcc atc cct gag ttg gct gca ctg cca act | 624 |
| Asn Trp Leu Lys His Ile Ser Ile Pro Glu Leu Ala Ala Leu Pro Thr |     |
| 195 200 205   |     |
| tat ctc aag aac agg ctc tac ctg cac aac aac ccg ctg ccc tgt gac | 672 |
| Tyr Leu Lys Asn Arg Leu Tyr Leu His Asn Asn Pro Leu Pro Cys Asp |     |
| 210 215 220   |     |

|   |      |
|---|------|
| tgc agc ctc tac cac ctg ctc cgg cgc tgg cac cag cgg ggc ctg agt | 720  |
| Cys Ser Leu Tyr His Leu Leu Arg Arg Trp His Gln Arg Gly Leu Ser |      |
| 225 230 235 240   |      |
| gcc ctg cat gat ttt gaa cgc gag tac aca tgc ttg gtc ttt aag gtg | 768  |
| Ala Leu His Asp Phe Glu Arg Glu Tyr Thr Cys Leu Val Phe Lys Val |      |
| 245 250 255   |      |
| tca gag tcc cga gtg cgc ttt ttt gag cac agc cgg gtc ttc aag aac | 816  |
| Ser Glu Ser Arg Val Arg Phe Phe Glu His Ser Arg Val Phe Lys Asn |      |
| 260 265 270   |      |
| tgc tct gtg gct gca gct cca ggc tta gag ctg cct gaa gag cag ctg | 864  |
| Cys Ser Val Ala Ala Ala Pro Gly Leu Glu Leu Pro Glu Glu Gln Leu |      |
| 275 280 285   |      |
| cac gcg cag gtg ggc cag tcc ctg agg ctc ttc tgc aac acc agt gtg | 912  |
| His Ala Gln Val Gly Gln Ser Leu Arg Leu Phe Cys Asn Thr Ser Val |      |
| 290 295 300   |      |
| cct gcc act cgg gtg gcc tgg gtc tcc ccg aag aat gag ctg ctt gtg | 960  |
| Pro Ala Thr Arg Val Ala Trp Val Ser Pro Lys Asn Glu Leu Leu Val |      |
| 305 310 315 320   |      |
| gcg cca gcc tct cag gat ggt agc atc gct gtg ttg gct gat ggc agc | 1008 |
| Ala Pro Ala Ser Gln Asp Gly Ser Ile Ala Val Leu Ala Asp Gly Ser |      |
| 325 330 335   |      |
| tta gcc ata ggc agg gtg caa gag cag cac gca ggc gtc ttt gtg tgc | 1056 |
| Leu Ala Ile Gly Arg Val Gln Glu Gln His Ala Gly Val Phe Val Cys |      |
| 340 345 350   |      |
| ctg gcc agt ggg ccc cgc ctg cac cac aac cag aca ctt gag tac aat | 1104 |
| Leu Ala Ser Gly Pro Arg Leu His His Asn Gln Thr Leu Glu Tyr Asn |      |
| 355 360 365   |      |
| gtg agt gtg caa aag gct cgc ccc gag cca gag act ttc aac aca gcg | 1152 |
| Val Ser Val Gln Lys Ala Arg Pro Glu Pro Glu Thr Phe Asn Thr Ala |      |
| 370 375 380   |      |
| gcc gcg gat ccc atc gaa ggt cgt ggt ggt ggt ggt gat ccc aaa     | 1200 |
| Ala Ala Asp Pro Ile Glu Gly Arg Gly Gly Gly Gly Gly Asp Pro Lys |      |
| 385 390 395 400   |      |
| tct tgt gac aaa cct cac aca tgc cca ccg tgc cca gca cct gaa ctc | 1248 |
| Ser Cys Asp Lys Pro His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu |      |
| 405 410 415   |      |
| ctg ggg gga ccg tca gtc ttc ctc ttc ccc cca aaa ccc aag gac acc | 1296 |
| Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr |      |
| 420 425 430   |      |
| ctc atg atc tcc cgg acc cct gag gtc aca tgc gtg gtg gtg gac gtg | 1344 |
| Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val |      |
| 435 440 445   |      |
| agc cac gaa gac cct gag gtc aag ttc aac tgg tac gtg gac ggc gtg | 1392 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Ser | His | Glu | Asp | Pro | Glu | Val | Lys | Phe | Asn | Trp | Tyr | Val | Asp | Gly | Val |      |
| 450 |     |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |      |
| gag | gtg | cat | aat | gcc | aag | aca | aag | ccg | cgg | gag | gag | cag | tac | aac | agc | 1440 |
| Glu | Val | His | Asn | Ala | Lys | Thr | Lys | Pro | Arg | Glu | Glu | Gln | Tyr | Asn | Ser |      |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |      |
| acg | tac | cgg | gtg | gtc | agc | gtc | ctc | acc | gtc | ctg | cac | cag | gac | tgg | ctg | 1488 |
| Thr | Tyr | Arg | Val | Val | Ser | Val | Leu | Thr | Val | Leu | His | Gln | Asp | Trp | Leu |      |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |      |
| aat | ggc | aag | gag | tac | aag | tgc | aag | gtc | tcc | aac | aaa | gcc | ctc | cca | gcc | 1536 |
| Asn | Gly | Lys | Glu | Tyr | Lys | Cys | Lys | Val | Ser | Asn | Lys | Ala | Leu | Pro | Ala |      |
|     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |     |     |      |
| ccc | atc | gag | aaa | acc | atc | tcc | aaa | gcc | aaa | ggg | cag | ccc | cga | gaa | cca | 1584 |
| Pro | Ile | Glu | Lys | Thr | Ile | Ser | Lys | Ala | Lys | Gly | Gln | Pro | Arg | Glu | Pro |      |
|     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |      |
| cag | gtg | tac | acc | ctg | ccc | cca | tcc | cgg | gat | gag | ctg | acc | aag | aac | cag | 1632 |
| Gln | Val | Tyr | Thr | Leu | Pro | Pro | Ser | Arg | Asp | Glu | Leu | Thr | Lys | Asn | Gln |      |
|     |     | 530 |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |      |
| gtc | agc | ctg | acc | tgc | ctg | gtc | aaa | ggc | ttc | tat | ccc | agc | gac | atc | gcc | 1680 |
| Val | Ser | Leu | Thr | Cys | Leu | Val | Lys | Gly | Phe | Tyr | Pro | Ser | Asp | Ile | Ala |      |
| 545 |     |     |     |     | 550 |     |     |     |     | 555 |     |     |     |     | 560 |      |
| gtg | gag | tgg | gag | agc | aat | ggg | cag | ccg | gag | aac | aac | tac | aag | acc | acg | 1728 |
| Val | Glu | Trp | Glu | Ser | Asn | Gly | Gln | Pro | Glu | Asn | Asn | Tyr | Lys | Thr | Thr |      |
|     |     |     |     | 565 |     |     |     |     | 570 |     |     |     |     | 575 |     |      |
| cct | ccc | gtg | ctg | gac | tcc | gac | ggc | tcc | ttc | ttc | ctc | tac | agc | aag | ctc | 1776 |
| Pro | Pro | Val | Leu | Asp | Ser | Asp | Gly | Ser | Phe | Phe | Leu | Tyr | Ser | Lys | Leu |      |
|     |     |     | 580 |     |     |     |     | 585 |     |     |     |     | 590 |     |     |      |
| acc | gtg | gac | aag | agc | agg | tgg | cag | cag | ggg | aac | gtc | ttc | tca | tgc | tcc | 1824 |
| Thr | Val | Asp | Lys | Ser | Arg | Trp | Gln | Gln | Gly | Asn | Val | Phe | Ser | Cys | Ser |      |
|     |     | 595 |     |     |     |     | 600 |     |     |     |     | 605 |     |     |     |      |
| gtg | atg | cat | gag | gct | ctg | cac | aac | cac | tac | acg | cag | aag | agc | ctc | tcc | 1872 |
| Val | Met | His | Glu | Ala | Leu | His | Asn | His | Tyr | Thr | Gln | Lys | Ser | Leu | Ser |      |
|     | 610 |     |     |     |     | 615 |     |     |     |     | 620 |     |     |     |     |      |
| ctg | tct | ccg | ggt | aaa |     |     |     |     |     |     |     |     |     |     |     | 1887 |
| Leu | Ser | Pro | Gly | Lys |     |     |     |     |     |     |     |     |     |     |     |      |
| 625 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |

<210> 12

<211> 629

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Ig-fusion protein

<400> 12

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Trp | Leu | Val | Leu | Ser | Gly | Ile | Leu | Leu | Cys | Met | Leu | Gly | Ala | 1   | 5   | 10  | 15  |
| Gly | Leu | Gly | Thr | Ser | Asp | Leu | Glu | Asp | Val | Leu | Pro | Pro | Ala | Pro | His | 20  | 25  | 30  |     |
| Asn | Cys | Pro | Asp | Ile | Cys | Ile | Cys | Ala | Ala | Asp | Val | Leu | Ser | Cys | Ala | 35  | 40  | 45  |     |
| Gly | Arg | Gly | Leu | Gln | Asp | Leu | Pro | Val | Ala | Leu | Pro | Thr | Thr | Ala | Ala | 50  | 55  | 60  |     |
| Glu | Leu | Asp | Leu | Ser | His | Asn | Ala | Leu | Lys | Arg | Leu | His | Pro | Gly | Trp | 65  | 70  | 75  | 80  |
| Leu | Ala | Pro | Leu | Ser | Arg | Leu | Arg | Ala | Leu | His | Leu | Gly | Tyr | Asn | Lys | 85  | 90  | 95  |     |
| Leu | Glu | Val | Leu | Gly | His | Gly | Ala | Phe | Thr | Asn | Ala | Ser | Gly | Leu | Arg | 100 | 105 | 110 |     |
| Thr | Leu | Asp | Leu | Ser | Ser | Asn | Met | Leu | Arg | Met | Leu | His | Thr | His | Asp | 115 | 120 | 125 |     |
| Leu | Asp | Gly | Leu | Glu | Glu | Leu | Glu | Lys | Leu | Leu | Leu | Phe | Asn | Asn | Ser | 130 | 135 | 140 |     |
| Leu | Met | His | Leu | Asp | Leu | Asp | Ala | Phe | Gln | Gly | Leu | Arg | Met | Leu | Ser | 145 | 150 | 155 | 160 |
| His | Leu | Tyr | Leu | Ser | Cys | Asn | Glu | Leu | Ser | Ser | Phe | Ser | Phe | Asn | His | 165 | 170 | 175 |     |
| Leu | His | Gly | Leu | Gly | Leu | Thr | Arg | Leu | Arg | Thr | Leu | Asp | Leu | Ser | Ser | 180 | 185 | 190 |     |
| Asn | Trp | Leu | Lys | His | Ile | Ser | Ile | Pro | Glu | Leu | Ala | Ala | Leu | Pro | Thr | 195 | 200 | 205 |     |
| Tyr | Leu | Lys | Asn | Arg | Leu | Tyr | Leu | His | Asn | Asn | Pro | Leu | Pro | Cys | Asp | 210 | 215 | 220 |     |
| Cys | Ser | Leu | Tyr | His | Leu | Leu | Arg | Arg | Trp | His | Gln | Arg | Gly | Leu | Ser | 225 | 230 | 235 | 240 |
| Ala | Leu | His | Asp | Phe | Glu | Arg | Glu | Tyr | Thr | Cys | Leu | Val | Phe | Lys | Val | 245 | 250 | 255 |     |
| Ser | Glu | Ser | Arg | Val | Arg | Phe | Phe | Glu | His | Ser | Arg | Val | Phe | Lys | Asn | 260 | 265 | 270 |     |
| Cys | Ser | Val | Ala | Ala | Ala | Pro | Gly | Leu | Glu | Leu | Pro | Glu | Glu | Gln | Leu | 275 | 280 | 285 |     |
| His | Ala | Gln | Val | Gly | Gln | Ser | Leu | Arg | Leu | Phe | Cys | Asn | Thr | Ser | Val | 290 | 295 | 300 |     |

Pro Ala Thr Arg Val Ala Trp Val Ser Pro Lys Asn Glu Leu Leu Val  
 305 310 315 320  
 Ala Pro Ala Ser Gln Asp Gly Ser Ile Ala Val Leu Ala Asp Gly Ser  
 325 330 335  
 Leu Ala Ile Gly Arg Val Gln Glu Gln His Ala Gly Val Phe Val Cys  
 340 345 350  
 Leu Ala Ser Gly Pro Arg Leu His His Asn Gln Thr Leu Glu Tyr Asn  
 355 360 365  
 Val Ser Val Gln Lys Ala Arg Pro Glu Pro Glu Thr Phe Asn Thr Ala  
 370 375 380  
 Ala Ala Asp Pro Ile Glu Gly Arg Gly Gly Gly Gly Gly Asp Pro Lys  
 385 390 395 400  
 Ser Cys Asp Lys Pro His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu  
 405 410 415  
 Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr  
 420 425 430  
 Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val  
 435 440 445  
 Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val  
 450 455 460  
 Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser  
 465 470 475 480  
 Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu  
 485 490 495  
 Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala  
 500 505 510  
 Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro  
 515 520 525  
 Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln  
 530 535 540  
 Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala  
 545 550 555 560  
 Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr  
 565 570 575  
 Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu  
 580 585 590  
 Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser  
 595 600 605

Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser  
610 615 620

Leu Ser Pro Gly Lys  
625

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<212> DNA  
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<221> CDS  
<222> (1)..(1476)

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1 5 10 15  
gtg ttc ctg ctt ctc ttt gag gta gcc agg gcc ggc cga tct gtg gtt 96  
Val Phe Leu Leu Phe Glu Val Ala Arg Ala Gly Arg Ser Val Val  
20 25 30  
agt tgt ccc gcc aac tgc ctg tgc gcc agc aac atc ctc agc tgc tcc 144  
Ser Cys Pro Ala Asn Cys Leu Cys Ala Ser Asn Ile Leu Ser Cys Ser  
35 40 45  
aag cag cag ctg ccc aat gtg ccc caa tct ttg ccc agc tac aca gca 192  
Lys Gln Gln Leu Pro Asn Val Pro Gln Ser Leu Pro Ser Tyr Thr Ala  
50 55 60  
ctg ctg gac ctc agc cac aac aac ttg agc agg ctg cgg gcc gag tgg 240  
Leu Leu Asp Leu Ser His Asn Asn Leu Ser Arg Leu Arg Ala Glu Trp  
65 70 75 80  
acc ccc acc cgg ctg acc aac ctg cac tcc ctg ctg ctg agc cac aac 288  
Thr Pro Thr Arg Leu Thr Asn Leu His Ser Leu Leu Leu Ser His Asn  
85 90 95  
cac ctg aac ttc atc tcc tcc gag gcc ttc gtc ccc gta ccc aac ctt 336  
His Leu Asn Phe Ile Ser Ser Glu Ala Phe Val Pro Val Pro Asn Leu  
100 105 110  
agg tac ttg gac ctc tcc tcc aac cat ctt cac acg ctg gat gag ttc 384  
Arg Tyr Leu Asp Leu Ser Ser Asn His Leu His Thr Leu Asp Glu Phe  
115 120 125  
ctg ttc agc gac ctg cag gcg ctg gaa gtg ctg ttg ctc tac aat aac 432  
Leu Phe Ser Asp Leu Gln Ala Leu Glu Val Leu Leu Leu Tyr Asn Asn  
130 135 140  
cac att gtg gtg gtg gac cgg aat gcc ttt gag gac atg gcc cag ctg 480  
His Ile Val Val Val Asp Arg Asn Ala Phe Glu Asp Met Ala Gln Leu

| 145   | 150                 | 155                 | 160         |      |
|---|---------------------|---------------------|-------------|------|
| cag aaa ctc tac tta agc cag aat cag atc tct cgc ttt cct gtg gaa |                     |                     |             | 528  |
| Gln Lys Leu Tyr   | Leu Ser Gln Asn     | Gln Ile Ser Arg Phe | Pro Val Glu |      |
|   | 165                 | 170                 | 175         |      |
| ctg atc aag gat ggg aac aaa tta ccc aaa ctg atg ctc ttg gat ctg |                     |                     |             | 576  |
| Leu Ile Lys Asp   | Gly Asn Lys Leu     | Pro Lys Leu Met Leu | Leu Asp Leu |      |
|   | 180                 | 185                 | 190         |      |
| tcc tcc aac aag ctg aag aag ttg ccc ctg act gac ctg cag aaa ttg |                     |                     |             | 624  |
| Ser Ser Asn Lys Leu Lys Lys Leu                                 | Pro Leu Thr Asp Leu | Gln Lys Leu         |             |      |
|   | 195                 | 200                 | 205         |      |
| cca gcc tgg gtc aag aat ggg cta tac ctg cat aac aac ccc ttg gag |                     |                     |             | 672  |
| Pro Ala Trp Val Lys Asn Gly Leu Tyr Leu His Asn Asn Pro Leu Glu |                     |                     |             |      |
|   | 210                 | 215                 | 220         |      |
| tgc gac tgc aag ctc tac cag ctc ttt tcg cac tgg cag tac cgg cag |                     |                     |             | 720  |
| Cys Asp Cys Lys Leu Tyr Gln Leu Phe Ser His Trp Gln Tyr Arg Gln |                     |                     |             |      |
|   | 225                 | 230                 | 235         | 240  |
| ctg agc tct gtg atg gac ttc cag gag gac ctg tac tgc atg cac tcc |                     |                     |             | 768  |
| Leu Ser Ser Val Met Asp Phe Gln Glu Asp Leu Tyr Cys Met His Ser |                     |                     |             |      |
|   | 245                 | 250                 | 255         |      |
| aag aag ctg cac aac atc ttc agc ctg gat ttc ttc aat tgc agc gag |                     |                     |             | 816  |
| Lys Lys Leu His Asn Ile Phe Ser Leu Asp Phe Phe Asn Cys Ser Glu |                     |                     |             |      |
|   | 260                 | 265                 | 270         |      |
| tac aag gaa agt gcc tgg gag gct cac ctg gga gac acc ttg acc atc |                     |                     |             | 864  |
| Tyr Lys Glu Ser Ala Trp Glu Ala His Leu Gly Asp Thr Leu Thr Ile |                     |                     |             |      |
|   | 275                 | 280                 | 285         |      |
| agg tgt gac acc aaa cag caa ggc atg acc aaa gtg tgg gtg tcc cca |                     |                     |             | 912  |
| Arg Cys Asp Thr Lys Gln Gln Gly Met Thr Lys Val Trp Val Ser Pro |                     |                     |             |      |
|   | 290                 | 295                 | 300         |      |
| agc aat gaa cag gtg cta agt cag ggg tcc aat ggc tcg gtg agc gtg |                     |                     |             | 960  |
| Ser Asn Glu Gln Val Leu Ser Gln Gly Ser Asn Gly Ser Val Ser Val |                     |                     |             |      |
|   | 305                 | 310                 | 315         | 320  |
| agg aat ggc gac ctt ttt ttt aaa aag gtg cag gtc gag gat ggg ggt |                     |                     |             | 1008 |
| Arg Asn Gly Asp Leu Phe Phe Lys Lys Val Gln Val Glu Asp Gly Gly |                     |                     |             |      |
|   | 325                 | 330                 | 335         |      |
| gtg tat acc tgt tac gcc atg ggg gag act ttc aac gag aca ctg tct |                     |                     |             | 1056 |
| Val Tyr Thr Cys Tyr Ala Met Gly Glu Thr Phe Asn Glu Thr Leu Ser |                     |                     |             |      |
|   | 340                 | 345                 | 350         |      |
| gtg gag ttg aaa gtg tat aac ttc acc ttg cac gga cac cat gac acc |                     |                     |             | 1104 |
| Val Glu Leu Lys Val Tyr Asn Phe Thr Leu His Gly His His Asp Thr |                     |                     |             |      |
|   | 355                 | 360                 | 365         |      |
| ctc aac aca gcc tac act acc ctg gtg ggc tgt atc ctc agt gtg gtt |                     |                     |             | 1152 |
| Leu Asn Thr Ala Tyr Thr Thr Leu Val Gly Cys Ile Leu Ser Val Val |                     |                     |             |      |
|   | 370                 | 375                 | 380         |      |

ctg gtc ctc ata tac ttg tac ctc acc cct tgc cgc tgc tgg tgt cgg 1200  
 Leu Val Leu Ile Tyr Leu Tyr Leu Thr Pro Cys Arg Cys Trp Cys Arg  
 385 390 395 400

ggt gtg gag aaa cct tcc agc cac caa gga gat agc ctc agc tct tct 1248  
 Gly Val Glu Lys Pro Ser Ser His Gln Gly Asp Ser Leu Ser Ser Ser  
 405 410 415

atg ctc agt acc aca ccc aac cac gac cct atg gct ggt ggg gac aaa 1296  
 Met Leu Ser Thr Thr Pro Asn His Asp Pro Met Ala Gly Gly Asp Lys  
 420 425 430

gat gat ggt ttt gac cgg cgg gtg gcc ttc ctg gaa cct gct gga ccc 1344  
 Asp Asp Gly Phe Asp Arg Arg Val Ala Phe Leu Glu Pro Ala Gly Pro  
 435 440 445

ggg cag ggt caa aat ggc aaa ctc aag cca ggc aac act ctg ccg gtg 1392  
 Gly Gln Gly Gln Asn Gly Lys Leu Lys Pro Gly Asn Thr Leu Pro Val  
 450 455 460

ccc gaa gct aca ggc aag ggc caa cgg agg atg tcc gat cca gag tcg 1440  
 Pro Glu Ala Thr Gly Lys Gly Gln Arg Arg Met Ser Asp Pro Glu Ser  
 465 470 475 480

gtc agc tcg gtc ttt tct gat aca ccc att gtg gtg 1476  
 Val Ser Ser Val Phe Ser Asp Thr Pro Ile Val Val  
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<211> 492

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<213> Mus musculus

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Val Phe Leu Leu Leu Phe Glu Val Ala Arg Ala Gly Arg Ser Val Val  
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Ser Cys Pro Ala Asn Cys Leu Cys Ala Ser Asn Ile Leu Ser Cys Ser  
 35 40 45

Lys Gln Gln Leu Pro Asn Val Pro Gln Ser Leu Pro Ser Tyr Thr Ala  
 50 55 60

Leu Leu Asp Leu Ser His Asn Asn Leu Ser Arg Leu Arg Ala Glu Trp  
 65 70 75 80

Thr Pro Thr Arg Leu Thr Asn Leu His Ser Leu Leu Leu Ser His Asn  
 85 90 95

His Leu Asn Phe Ile Ser Ser Glu Ala Phe Val Pro Val Pro Asn Leu  
 100 105 110



Arg Tyr Leu Asp Leu Ser Ser Asn His Leu His Thr Leu Asp Glu Phe  
 115 120 125  
 Leu Phe Ser Asp Leu Gln Ala Leu Glu Val Leu Leu Leu Tyr Asn Asn  
 130 135 140  
 His Ile Val Val Val Asp Arg Asn Ala Phe Glu Asp Met Ala Gln Leu  
 145 150 155 160  
 Gln Lys Leu Tyr Leu Ser Gln Asn Gln Ile Ser Arg Phe Pro Val Glu  
 165 170 175  
 Leu Ile Lys Asp Gly Asn Lys Leu Pro Lys Leu Met Leu Leu Asp Leu  
 180 185 190  
 Ser Ser Asn Lys Leu Lys Lys Leu Pro Leu Thr Asp Leu Gln Lys Leu  
 195 200 205  
 Pro Ala Trp Val Lys Asn Gly Leu Tyr Leu His Asn Asn Pro Leu Glu  
 210 215 220  
 Cys Asp Cys Lys Leu Tyr Gln Leu Phe Ser His Trp Gln Tyr Arg Gln  
 225 230 235 240  
 Leu Ser Ser Val Met Asp Phe Gln Glu Asp Leu Tyr Cys Met His Ser  
 245 250 255  
 Lys Lys Leu His Asn Ile Phe Ser Leu Asp Phe Phe Asn Cys Ser Glu  
 260 265 270  
 Tyr Lys Glu Ser Ala Trp Glu Ala His Leu Gly Asp Thr Leu Thr Ile  
 275 280 285  
 Arg Cys Asp Thr Lys Gln Gln Gly Met Thr Lys Val Trp Val Ser Pro  
 290 295 300  
 Ser Asn Glu Gln Val Leu Ser Gln Gly Ser Asn Gly Ser Val Ser Val  
 305 310 315 320  
 Arg Asn Gly Asp Leu Phe Phe Lys Lys Val Gln Val Glu Asp Gly Gly  
 325 330 335  
 Val Tyr Thr Cys Tyr Ala Met Gly Glu Thr Phe Asn Glu Thr Leu Ser  
 340 345 350  
 Val Glu Leu Lys Val Tyr Asn Phe Thr Leu His Gly His His Asp Thr  
 355 360 365  
 Leu Asn Thr Ala Tyr Thr Thr Leu Val Gly Cys Ile Leu Ser Val Val  
 370 375 380  
 Leu Val Leu Ile Tyr Leu Tyr Leu Thr Pro Cys Arg Cys Trp Cys Arg  
 385 390 395 400  
 Gly Val Glu Lys Pro Ser Ser His Gln Gly Asp Ser Leu Ser Ser Ser  
 405 410 415

Met Leu Ser Thr Thr Pro Asn His Asp Pro Met Ala Gly Gly Asp Lys  
420 425 430

Asp Asp Gly Phe Asp Arg Arg Val Ala Phe Leu Glu Pro Ala Gly Pro  
435 440 445

Gly Gln Gly Gln Asn Gly Lys Leu Lys Pro Gly Asn Thr Leu Pro Val  
450 455 460

Pro Glu Ala Thr Gly Lys Gly Gln Arg Arg Met Ser Asp Pro Glu Ser  
465 470 475 480

Val Ser Ser Val Phe Ser Asp Thr Pro Ile Val Val  
485 490

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Met Ser Leu Arg Phe His Thr Leu Pro Thr Leu Pro Arg Ala Val Lys  
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ccg ggt tgc aga gag ctg ctg tgt ctg ttg gtg atc gca gtg atg gtg 96  
Pro Gly Cys Arg Glu Leu Leu Cys Leu Leu Val Ile Ala Val Met Val  
20 25 30

agc ccc agc gcc tca gga atg tgc ccc act gct tgc atc tgt gcc acc 144  
Ser Pro Ser Ala Ser Gly Met Cys Pro Thr Ala Cys Ile Cys Ala Thr  
35 40 45

gac att gtc agc tgc acc aac aaa aac cta tct aag gtg ccc ggg aac 192  
Asp Ile Val Ser Cys Thr Asn Lys Asn Leu Ser Lys Val Pro Gly Asn  
50 55 60

ctt ttc aga ctg att aaa aga ctg gat ctg agc tat aac aga atc gga 240  
Leu Phe Arg Leu Ile Lys Arg Leu Asp Leu Ser Tyr Asn Arg Ile Gly  
65 70 75 80

ctg ttg gat gcc gac tgg atc ccg gtg tcg ttt gtc aag ctg agc acc 288  
Leu Leu Asp Ala Asp Trp Ile Pro Val Ser Phe Val Lys Leu Ser Thr  
85 90 95

tta att ctt cgc cac aac aac atc acc agc atc tcc acg ggc agt ttc 336  
Leu Ile Leu Arg His Asn Asn Ile Thr Ser Ile Ser Thr Gly Ser Phe  
100 105 110

tcc aca acc cca aat tta aag tgt ctg gac tta tca tcc aat agg ctg 384  
Ser Thr Thr Pro Asn Leu Lys Cys Leu Asp Leu Ser Ser Asn Arg Leu

| 115   | 120 | 125 |      |
|---|-----|-----|------|
| aag tcg gta aag agt gcc aca ttc caa gag ctg aag gct ctg gaa gta<br>Lys Ser Val Lys Ser Ala Thr Phe Gln Glu Leu Lys Ala Leu Glu Val<br>130 135 140     |     |     | 432  |
| ctg ctg ctg tac aac aac cac att tcc tat ctg gac ccc gca gcg ttc<br>Leu Leu Leu Tyr Asn Asn His Ile Ser Tyr Leu Asp Pro Ala Ala Phe<br>145 150 155 160 |     |     | 480  |
| ggg ggg ctt tcc cac ttg cag aaa ctc tat ctg agt ggg aac ttt ctc<br>Gly Gly Leu Ser His Leu Gln Lys Leu Tyr Leu Ser Gly Asn Phe Leu<br>165 170 175     |     |     | 528  |
| aca cag ttc cct atg gat ttg tat act ggg agg ttc aag ctg gct gat<br>Thr Gln Phe Pro Met Asp Leu Tyr Thr Gly Arg Phe Lys Leu Ala Asp<br>180 185 190     |     |     | 576  |
| ctg aca ttt tta gat gtt tcc tat aat cga atc cct tcc ata ccg atg<br>Leu Thr Phe Leu Asp Val Ser Tyr Asn Arg Ile Pro Ser Ile Pro Met<br>195 200 205     |     |     | 624  |
| cac cat ata aac tta gtg ccg ggg aga cag ctg aga ggc atc tac ctt<br>His His Ile Asn Leu Val Pro Gly Arg Gln Leu Arg Gly Ile Tyr Leu<br>210 215 220     |     |     | 672  |
| cac ggg aac cca ttt gta tgt gac tgt tct ctg tac tcg ttg ctg atc<br>His Gly Asn Pro Phe Val Cys Asp Cys Ser Leu Tyr Ser Leu Leu Ile<br>225 230 235 240 |     |     | 720  |
| ttt tgg tac cgt agg cac ttt agc tcc gtg atg gat ttt aag aat gac<br>Phe Trp Tyr Arg Arg His Phe Ser Ser Val Met Asp Phe Lys Asn Asp<br>245 250 255     |     |     | 768  |
| tat acc tgt cgc ctg tgg tct gac tcc agg cac tcc cac cag ctg cag<br>Tyr Thr Cys Arg Leu Trp Ser Asp Ser Arg His Ser His Gln Leu Gln<br>260 265 270     |     |     | 816  |
| ctg ctc cag gag agc ttt ctg aac tgt tct tac agc gtt atc aac ggc<br>Leu Leu Gln Glu Ser Phe Leu Asn Cys Ser Tyr Ser Val Ile Asn Gly<br>275 280 285     |     |     | 864  |
| tcc ttc cac gca ctt ggc ttt atc cac gag gct cag gtt ggg gag agg<br>Ser Phe His Ala Leu Gly Phe Ile His Glu Ala Gln Val Gly Glu Arg<br>290 295 300     |     |     | 912  |
| gcg atc gtc cac tgt gac agc aag act ggc aat gga aat act gat ttc<br>Ala Ile Val His Cys Asp Ser Lys Thr Gly Asn Gly Asn Thr Asp Phe<br>305 310 315 320 |     |     | 960  |
| atc tgg gtc ggt ccc gat aac agg ctg ctg gag cca gat aaa gac atg<br>Ile Trp Val Gly Pro Asp Asn Arg Leu Leu Glu Pro Asp Lys Asp Met<br>325 330 335     |     |     | 1008 |
| ggg aac ttt cgt gtg ttt tac aac gga agt ctg gtc ata gag aac cct<br>Gly Asn Phe Arg Val Phe Tyr Asn Gly Ser Leu Val Ile Glu Asn Pro<br>340 345 350     |     |     | 1056 |

ggc ttt gag gac gcc ggg gta tat tct tgt atc gca atg aac agg cag 1104  
 Gly Phe Glu Asp Ala Gly Val Tyr Ser Cys Ile Ala Met Asn Arg Gln  
 355 360 365

cgg ctg tta aac gag acg gtg gat atc atg atc aac gtg agc aat ttc 1152  
 Arg Leu Leu Asn Glu Thr Val Asp Ile Met Ile Asn Val Ser Asn Phe  
 370 375 380

acc ata aac aga tcc cac gcc cac gag gcg ttt aac acg gcc ttt acc 1200  
 Thr Ile Asn Arg Ser His Ala His Glu Ala Phe Asn Thr Ala Phe Thr  
 385 390 395 400

acc ctg gct gcc tgc gtg gcc agt ata gtt cta gtg cta ctg tat ctg 1248  
 Thr Leu Ala Ala Cys Val Ala Ser Ile Val Leu Val Leu Leu Tyr Leu  
 405 410 415

tac ctg acg ccg tgc cca tgc aaa tgc aaa gcc aag aga cag aaa aac 1296  
 Tyr Leu Thr Pro Cys Pro Cys Lys Cys Lys Ala Lys Arg Gln Lys Asn  
 420 425 430

acg ctg agc caa agc agt gcc cac tcg tcc att ctc agt cct ggc ccc 1344  
 Thr Leu Ser Gln Ser Ser Ala His Ser Ser Ile Leu Ser Pro Gly Pro  
 435 440 445

act ggc gat gcc tct gct gac gat cgg aag gca ggt aaa aga gtc gtg 1392  
 Thr Gly Asp Ala Ser Ala Asp Arg Lys Ala Gly Lys Arg Val Val  
 450 455 460

ttt ctg gag ccc ctg aag gac acg gcg gcc gga cag aat ggc aaa gtc 1440  
 Phe Leu Glu Pro Leu Lys Asp Thr Ala Ala Gly Gln Asn Gly Lys Val  
 465 470 475 480

aag ctt ttc ccc agt gag acc gtt ata gcc gag ggc atc tta aag tcc 1488  
 Lys Leu Phe Pro Ser Glu Thr Val Ile Ala Glu Gly Ile Leu Lys Ser  
 485 490 495

acc agg gca aag tct gac tca gac tca gtc aat tcc gtg ttc tca gac 1536  
 Thr Arg Ala Lys Ser Asp Ser Asp Ser Val Asn Ser Val Phe Ser Asp  
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aca ccc ttt gtg gca tcc act 1557  
 Thr Pro Phe Val Ala Ser Thr  
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 Pro Gly Cys Arg Glu Leu Leu Cys Leu Leu Val Ile Ala Val Met Val  
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Ser Pro Ser Ala Ser Gly Met Cys Pro Thr Ala Cys Ile Cys Ala Thr  
 35 40 45  
 Asp Ile Val Ser Cys Thr Asn Lys Asn Leu Ser Lys Val Pro Gly Asn  
 50 55 60  
 Leu Phe Arg Leu Ile Lys Arg Leu Asp Leu Ser Tyr Asn Arg Ile Gly  
 65 70 75 80  
 Leu Leu Asp Ala Asp Trp Ile Pro Val Ser Phe Val Lys Leu Ser Thr  
 85 90 95  
 Leu Ile Leu Arg His Asn Asn Ile Thr Ser Ile Ser Thr Gly Ser Phe  
 100 105 110  
 Ser Thr Thr Pro Asn Leu Lys Cys Leu Asp Leu Ser Ser Asn Arg Leu  
 115 120 125  
 Lys Ser Val Lys Ser Ala Thr Phe Gln Glu Leu Lys Ala Leu Glu Val  
 130 135 140  
 Leu Leu Leu Tyr Asn Asn His Ile Ser Tyr Leu Asp Pro Ala Ala Phe  
 145 150 155 160  
 Gly Gly Leu Ser His Leu Gln Lys Leu Tyr Leu Ser Gly Asn Phe Leu  
 165 170 175  
 Thr Gln Phe Pro Met Asp Leu Tyr Thr Gly Arg Phe Lys Leu Ala Asp  
 180 185 190  
 Leu Thr Phe Leu Asp Val Ser Tyr Asn Arg Ile Pro Ser Ile Pro Met  
 195 200 205  
 His His Ile Asn Leu Val Pro Gly Arg Gln Leu Arg Gly Ile Tyr Leu  
 210 215 220  
 His Gly Asn Pro Phe Val Cys Asp Cys Ser Leu Tyr Ser Leu Leu Ile  
 225 230 235 240  
 Phe Trp Tyr Arg Arg His Phe Ser Ser Val Met Asp Phe Lys Asn Asp  
 245 250 255  
 Tyr Thr Cys Arg Leu Trp Ser Asp Ser Arg His Ser His Gln Leu Gln  
 260 265 270  
 Leu Leu Gln Glu Ser Phe Leu Asn Cys Ser Tyr Ser Val Ile Asn Gly  
 275 280 285  
 Ser Phe His Ala Leu Gly Phe Ile His Glu Ala Gln Val Gly Glu Arg  
 290 295 300  
 Ala Ile Val His Cys Asp Ser Lys Thr Gly Asn Gly Asn Thr Asp Phe  
 305 310 315 320  
 Ile Trp Val Gly Pro Asp Asn Arg Leu Leu Glu Pro Asp Lys Asp Met  
 325 330 335

Gly Asn Phe Arg Val Phe Tyr Asn Gly Ser Leu Val Ile Glu Asn Pro  
 340 345 350  
 Gly Phe Glu Asp Ala Gly Val Tyr Ser Cys Ile Ala Met Asn Arg Gln  
 355 360 365  
 Arg Leu Leu Asn Glu Thr Val Asp Ile Met Ile Asn Val Ser Asn Phe  
 370 375 380  
 Thr Ile Asn Arg Ser His Ala His Glu Ala Phe Asn Thr Ala Phe Thr  
 385 390 395 400  
 Thr Leu Ala Ala Cys Val Ala Ser Ile Val Leu Val Leu Leu Tyr Leu  
 405 410 415  
 Tyr Leu Thr Pro Cys Pro Cys Lys Cys Lys Ala Lys Arg Gln Lys Asn  
 420 425 430  
 Thr Leu Ser Gln Ser Ser Ala His Ser Ser Ile Leu Ser Pro Gly Pro  
 435 440 445  
 Thr Gly Asp Ala Ser Ala Asp Asp Arg Lys Ala Gly Lys Arg Val Val  
 450 455 460  
 Phe Leu Glu Pro Leu Lys Asp Thr Ala Ala Gly Gln Asn Gly Lys Val  
 465 470 475 480  
 Lys Leu Phe Pro Ser Glu Thr Val Ile Ala Glu Gly Ile Leu Lys Ser  
 485 490 495  
 Thr Arg Ala Lys Ser Asp Ser Asp Ser Val Asn Ser Val Phe Ser Asp  
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 Thr Pro Phe Val Ala Ser Thr  
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 1 5 10 15  
 gga ttg ggc act tca gac ttg gag gat gtt ctg cct cct gct ccc cac 96  
 Gly Leu Gly Thr Ser Asp Leu Glu Asp Val Leu Pro Pro Ala Pro His  
 20 25 30

|   |     |
|---|-----|
| aac tgc ccc gat ata tgc atc tgt gct gcc gat gtg ttg agc tgt gcg | 144 |
| Asn Cys Pro Asp Ile Cys Ile Cys Ala Ala Asp Val Leu Ser Cys Ala |     |
| 35 40 45  |     |
| ggc cgt ggg tta cag gac ttg ccg gta gca ctg cct acc act gct gca | 192 |
| Gly Arg Gly Leu Gln Asp Leu Pro Val Ala Leu Pro Thr Thr Ala Ala |     |
| 50 55 60  |     |
| gaa ctc gat ttg agc cac aac gca ctc aaa cgc ctg cac ccg ggg tgg | 240 |
| Glu Leu Asp Leu Ser His Asn Ala Leu Lys Arg Leu His Pro Gly Trp |     |
| 65 70 75 80   |     |
| tta gcg ccc ctc tcc cgg ctg cgt gcc ttg cac cta ggc tat aat aag | 288 |
| Leu Ala Pro Leu Ser Arg Leu Arg Ala Leu His Leu Gly Tyr Asn Lys |     |
| 85 90 95  |     |
| ctg gaa gtc ctg ggc cat ggt gcg ttc acc aat gcc agt ggc ctg agg | 336 |
| Leu Glu Val Leu Gly His Gly Ala Phe Thr Asn Ala Ser Gly Leu Arg |     |
| 100 105 110   |     |
| aca ctt gac ctg tcc tct aat atg tta agg atg ctc cat acc cat gac | 384 |
| Thr Leu Asp Leu Ser Ser Asn Met Leu Arg Met Leu His Thr His Asp |     |
| 115 120 125   |     |
| ctg gat ggc ctg gag gag ctg gag aag tta ctt ctg ttc aat aac agc | 432 |
| Leu Asp Gly Leu Glu Glu Leu Glu Lys Leu Leu Leu Phe Asn Asn Ser |     |
| 130 135 140   |     |
| ctg atg cac ttg gac ctg gat gcc ttc cag ggc ctg cgc atg ctt agc | 480 |
| Leu Met His Leu Asp Leu Asp Ala Phe Gln Gly Leu Arg Met Leu Ser |     |
| 145 150 155 160   |     |
| cac ctc tat ctc agc tgc aac gag ctc tcc tct ttc tct ttc aac cac | 528 |
| His Leu Tyr Leu Ser Cys Asn Glu Leu Ser Ser Phe Ser Phe Asn His |     |
| 165 170 175   |     |
| ttg cac ggt ctg ggg tta acc cgc ctg cgg act ctg gac ctc tcc tcc | 576 |
| Leu His Gly Leu Gly Leu Thr Arg Leu Arg Thr Leu Asp Leu Ser Ser |     |
| 180 185 190   |     |
| aac tgg ctg aaa cat atc tcc atc cct gag ttg gct gca ctg cca act | 624 |
| Asn Trp Leu Lys His Ile Ser Ile Pro Glu Leu Ala Ala Leu Pro Thr |     |
| 195 200 205   |     |
| tat ctc aag aac agg ctc tac ctg cac aac aac ccg ctg ccc tgt gac | 672 |
| Tyr Leu Lys Asn Arg Leu Tyr Leu His Asn Asn Pro Leu Pro Cys Asp |     |
| 210 215 220   |     |
| tgc agc ctc tac cac ctg ctc cgg cgc tgg cac cag cgg ggc ctg agt | 720 |
| Cys Ser Leu Tyr His Leu Leu Arg Arg Trp His Gln Arg Gly Leu Ser |     |
| 225 230 235 240   |     |
| gcc ctg cat gat ttt gaa cgc gag tac aca tgc ttg gtc ttt aag gtg | 768 |
| Ala Leu His Asp Phe Glu Arg Glu Tyr Thr Cys Leu Val Phe Lys Val |     |
| 245 250 255   |     |
| tca gag tcc cga gtg cgc ttt ttt gag cac agc cgg gtc ttc aag aac | 816 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Ser | Glu | Ser | Arg | Val | Arg | Phe | Phe | Glu | His | Ser | Arg | Val | Phe | Lys | Asn |      |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |      |
| tgc | tct | gtg | gct | gca | gct | cca | ggc | tta | gag | ctg | cct | gaa | gag | cag | ctg | 864  |
| Cys | Ser | Val | Ala | Ala | Ala | Pro | Gly | Leu | Glu | Leu | Pro | Glu | Glu | Gln | Leu |      |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |      |
| cac | gcg | cag | gtg | ggc | cag | tcc | ctg | agg | ctc | ttc | tgc | aac | acc | agt | gtg | 912  |
| His | Ala | Gln | Val | Gly | Gln | Ser | Leu | Arg | Leu | Phe | Cys | Asn | Thr | Ser | Val |      |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |      |
| cct | gcc | act | cgg | gtg | gcc | tgg | gtc | tcc | ccg | aag | aat | gag | ctg | ctt | gtg | 960  |
| Pro | Ala | Thr | Arg | Val | Ala | Trp | Val | Ser | Pro | Lys | Asn | Glu | Leu | Leu | Val |      |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |      |
| gcg | cca | gcc | tct | cag | gat | ggc | agc | atc | gct | gtg | ttg | gct | gat | ggc | agc | 1008 |
| Ala | Pro | Ala | Ser | Gln | Asp | Gly | Ser | Ile | Ala | Val | Leu | Ala | Asp | Gly | Ser |      |
|     |     |     |     | 325 |     |     |     | 330 |     |     |     |     |     | 335 |     |      |
| tta | gcc | ata | ggc | agg | gtg | caa | gag | cag | cac | gca | ggc | gtc | ttt | gtg | tgc | 1056 |
| Leu | Ala | Ile | Gly | Arg | Val | Gln | Glu | Gln | His | Ala | Gly | Val | Phe | Val | Cys |      |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |      |
| ctg | gcc | agt | ggg | ccc | cgc | ctg | cac | cac | aac | cag | aca | ctt | gag | tac | aat | 1104 |
| Leu | Ala | Ser | Gly | Pro | Arg | Leu | His | His | Asn | Gln | Thr | Leu | Glu | Tyr | Asn |      |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |      |
| gtg | agt | gtg | caa | aag | gct | cgc | ccc | gag | cca | gag | act | ttc | aac | aca | ggc | 1152 |
| Val | Ser | Val | Gln | Lys | Ala | Arg | Pro | Glu | Pro | Glu | Thr | Phe | Asn | Thr | Gly |      |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |      |
| ttt | acc | acc | ctg | ctg | ggc | tgt | att | gtg | ggc | ctg | gtg | ctg | gtg | ttg | ctc | 1200 |
| Phe | Thr | Thr | Leu | Leu | Gly | Cys | Ile | Val | Gly | Leu | Val | Leu | Val | Leu | Leu |      |
| 385 |     |     |     |     | 390 |     |     |     | 395 |     |     |     |     |     | 400 |      |
| tac | ttg | ttt | gca | cca | ccc | tgt | cgt | ggc | tgc | tgt | cac | tgc | tgt | cag | cgg | 1248 |
| Tyr | Leu | Phe | Ala | Pro | Pro | Cys | Arg | Gly | Cys | Cys | His | Cys | Cys | Gln | Arg |      |
|     |     |     |     | 405 |     |     |     | 410 |     |     |     |     |     | 415 |     |      |
| gcc | tgc | cgc | aac | cgt | tgc | tgg | ccc | cgg | gca | tcc | agt | cca | ctc | cag | gag | 1296 |
| Ala | Cys | Arg | Asn | Arg | Cys | Trp | Pro | Arg | Ala | Ser | Ser | Pro | Leu | Gln | Glu |      |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |      |
| ctg | agc | gca | cag | tcc | tcc | atg | ctc | agc | act | acg | cca | cca | gat | gca | ccc | 1344 |
| Leu | Ser | Ala | Gln | Ser | Ser | Met | Leu | Ser | Thr | Thr | Pro | Pro | Asp | Ala | Pro |      |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |      |
| agc | cgc | aag | gcc | agt | gtc | cac | aag | cat | gtg | gtc | ttc | ctg | gag | ccg | ggc | 1392 |
| Ser | Arg | Lys | Ala | Ser | Val | His | Lys | His | Val | Val | Phe | Leu | Glu | Pro | Gly |      |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |      |
| aag | aag | ggc | ctc | aat | ggc | cgt | gtg | cag | ctc | gca | gta | gct | gaa | gac | ttc | 1440 |
| Lys | Lys | Gly | Leu | Asn | Gly | Arg | Val | Gln | Leu | Ala | Val | Ala | Glu | Asp | Phe |      |
| 465 |     |     |     |     | 470 |     |     |     | 475 |     |     |     |     |     | 480 |      |
| gat | ctg | tgc | aac | ccc | atg | ggc | ttg | caa | ctc | aag | gct | ggc | tct | gaa | tca | 1488 |
| Asp | Leu | Cys | Asn | Pro | Met | Gly | Leu | Gln | Leu | Lys | Ala | Gly | Ser | Glu | Ser |      |



|   |     |  |     |  |     |      |
|---|-----|--|-----|--|-----|------|
|   | 485 |  | 490 |  | 495 |      |
| gcc agt tcc acg ggc tca gag ggt ctc gtg atg agc                 |     |  |     |  |     | 1524 |
| Ala Ser Ser Thr Gly Ser Glu Gly Leu Val Met Ser                 |     |  |     |  |     |      |
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| <213> Mus musculus  |     |  |     |  |     |      |
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| <400> 18  |     |  |     |  |     |      |
| Met Ala Trp Leu Val Leu Ser Gly Ile Leu Leu Cys Met Leu Gly Ala |     |  |     |  |     |      |
| 1   | 5   |  | 10  |  | 15  |      |
|   |     |  |     |  |     |      |
| Gly Leu Gly Thr Ser Asp Leu Glu Asp Val Leu Pro Pro Ala Pro His |     |  |     |  |     |      |
|   | 20  |  | 25  |  | 30  |      |
|   |     |  |     |  |     |      |
| Asn Cys Pro Asp Ile Cys Ile Cys Ala Ala Asp Val Leu Ser Cys Ala |     |  |     |  |     |      |
|   | 35  |  | 40  |  | 45  |      |
|   |     |  |     |  |     |      |
| Gly Arg Gly Leu Gln Asp Leu Pro Val Ala Leu Pro Thr Thr Ala Ala |     |  |     |  |     |      |
|   | 50  |  | 55  |  | 60  |      |
|   |     |  |     |  |     |      |
| Glu Leu Asp Leu Ser His Asn Ala Leu Lys Arg Leu His Pro Gly Trp |     |  |     |  |     |      |
|   | 65  |  | 70  |  | 75  | 80   |
|   |     |  |     |  |     |      |
| Leu Ala Pro Leu Ser Arg Leu Arg Ala Leu His Leu Gly Tyr Asn Lys |     |  |     |  |     |      |
|   | 85  |  | 90  |  | 95  |      |
|   |     |  |     |  |     |      |
| Leu Glu Val Leu Gly His Gly Ala Phe Thr Asn Ala Ser Gly Leu Arg |     |  |     |  |     |      |
|   | 100 |  | 105 |  | 110 |      |
|   |     |  |     |  |     |      |
| Thr Leu Asp Leu Ser Ser Asn Met Leu Arg Met Leu His Thr His Asp |     |  |     |  |     |      |
|   | 115 |  | 120 |  | 125 |      |
|   |     |  |     |  |     |      |
| Leu Asp Gly Leu Glu Glu Leu Glu Lys Leu Leu Leu Phe Asn Asn Ser |     |  |     |  |     |      |
|   | 130 |  | 135 |  | 140 |      |
|   |     |  |     |  |     |      |
| Leu Met His Leu Asp Leu Asp Ala Phe Gln Gly Leu Arg Met Leu Ser |     |  |     |  |     |      |
|   | 145 |  | 150 |  | 155 | 160  |
|   |     |  |     |  |     |      |
| His Leu Tyr Leu Ser Cys Asn Glu Leu Ser Ser Phe Ser Phe Asn His |     |  |     |  |     |      |
|   | 165 |  | 170 |  | 175 |      |
|   |     |  |     |  |     |      |
| Leu His Gly Leu Gly Leu Thr Arg Leu Arg Thr Leu Asp Leu Ser Ser |     |  |     |  |     |      |
|   | 180 |  | 185 |  | 190 |      |
|   |     |  |     |  |     |      |
| Asn Trp Leu Lys His Ile Ser Ile Pro Glu Leu Ala Ala Leu Pro Thr |     |  |     |  |     |      |
|   | 195 |  | 200 |  | 205 |      |
|   |     |  |     |  |     |      |
| Tyr Leu Lys Asn Arg Leu Tyr Leu His Asn Asn Pro Leu Pro Cys Asp |     |  |     |  |     |      |
|   | 210 |  | 215 |  | 220 |      |
|   |     |  |     |  |     |      |
| Cys Ser Leu Tyr His Leu Leu Arg Arg Trp His Gln Arg Gly Leu Ser |     |  |     |  |     |      |
|   | 225 |  | 230 |  | 235 | 240  |

Ala Leu His Asp Phe Glu Arg Glu Tyr Thr Cys Leu Val Phe Lys Val  
 245 250 255  
 Ser Glu Ser Arg Val Arg Phe Phe Glu His Ser Arg Val Phe Lys Asn  
 260 265 270  
 Cys Ser Val Ala Ala Ala Pro Gly Leu Glu Leu Pro Glu Glu Gln Leu  
 275 280 285  
 His Ala Gln Val Gly Gln Ser Leu Arg Leu Phe Cys Asn Thr Ser Val  
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 Pro Ala Thr Arg Val Ala Trp Val Ser Pro Lys Asn Glu Leu Leu Val  
 305 310 315 320  
 Ala Pro Ala Ser Gln Asp Gly Ser Ile Ala Val Leu Ala Asp Gly Ser  
 325 330 335  
 Leu Ala Ile Gly Arg Val Gln Glu Gln His Ala Gly Val Phe Val Cys  
 340 345 350  
 Leu Ala Ser Gly Pro Arg Leu His His Asn Gln Thr Leu Glu Tyr Asn  
 355 360 365  
 Val Ser Val Gln Lys Ala Arg Pro Glu Pro Glu Thr Phe Asn Thr Gly  
 370 375 380  
 Phe Thr Thr Leu Leu Gly Cys Ile Val Gly Leu Val Leu Val Leu Leu  
 385 390 395 400  
 Tyr Leu Phe Ala Pro Pro Cys Arg Gly Cys Cys His Cys Cys Gln Arg  
 405 410 415  
 Ala Cys Arg Asn Arg Cys Trp Pro Arg Ala Ser Ser Pro Leu Gln Glu  
 420 425 430  
 Leu Ser Ala Gln Ser Ser Met Leu Ser Thr Thr Pro Pro Asp Ala Pro  
 435 440 445  
 Ser Arg Lys Ala Ser Val His Lys His Val Val Phe Leu Glu Pro Gly  
 450 455 460  
 Lys Lys Gly Leu Asn Gly Arg Val Gln Leu Ala Val Ala Glu Asp Phe  
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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| atg | cga | ccc | tcc | ggg | acg | gcc | ggg | gca | gcg | ctc | ctg | gcg | ctg | ctg | gct | 48 |
| Met | Arg | Pro | Ser | Gly | Thr | Ala | Gly | Ala | Ala | Leu | Leu | Ala | Leu | Leu | Ala |    |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     |     | 15  |     |    |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| gcg | ctc | tgc | ccg | gcg | agt | cgg | gct | ctg | gag | gaa | aag | aaa | gtt | tgc | caa | 96 |
| Ala | Leu | Cys | Pro | Ala | Ser | Arg | Ala | Leu | Glu | Glu | Lys | Lys | Val | Cys | Gln |    |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |    |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ggc | acg | agt | aac | aag | ctc | acg | cag | ttg | ggc | act | ttt | gaa | gat | cat | ttt | 144 |
| Gly | Thr | Ser | Asn | Lys | Leu | Thr | Gln | Leu | Gly | Thr | Phe | Glu | Asp | His | Phe |     |
|     |     | 35  |     |     |     |     | 40  |     |     |     | 45  |     |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ctc | agc | ctc | cag | agg | atg | ttc | aat | aac | tgt | gag | gtg | gtc | ctt | ggg | aat | 192 |
| Leu | Ser | Leu | Gln | Arg | Met | Phe | Asn | Asn | Cys | Glu | Val | Val | Leu | Gly | Asn |     |
|     | 50  |     |     |     |     | 55  |     |     |     | 60  |     |     |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ttg | gaa | att | acc | tat | gtg | cag | agg | aat | tat | gat | ctt | tcc | ttc | tta | aag | 240 |
| Leu | Glu | Ile | Thr | Tyr | Val | Gln | Arg | Asn | Tyr | Asp | Leu | Ser | Phe | Leu | Lys |     |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| acc | atc | cag | gag | gtg | gct | ggt | tat | gtc | ctc | att | gcc | ctc | aac | aca | gtg | 288 |
| Thr | Ile | Gln | Glu | Val | Ala | Gly | Tyr | Val | Leu | Ile | Ala | Leu | Asn | Thr | Val |     |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| gag | cga | att | cct | ttg | gaa | aac | ctg | cag | atc | atc | aga | gga | aat | atg | tac | 336 |
| Glu | Arg | Ile | Pro | Leu | Glu | Asn | Leu | Gln | Ile | Ile | Arg | Gly | Asn | Met | Tyr |     |
|     |     | 100 |     |     |     |     |     | 105 |     |     |     |     | 110 |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| tac | gaa | aat | tcc | tat | gcc | tta | gca | gtc | tta | tct | aac | tat | gat | gca | aat | 384 |
| Tyr | Glu | Asn | Ser | Tyr | Ala | Leu | Ala | Val | Leu | Ser | Asn | Tyr | Asp | Ala | Asn |     |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| aaa | acc | gga | ctg | aag | gag | ctg | ccc | atg | aga | aat | tta | cag | gaa | atc | ctg | 432 |
| Lys | Thr | Gly | Leu | Lys | Glu | Leu | Pro | Met | Arg | Asn | Leu | Gln | Glu | Ile | Leu |     |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| cat | ggc | gcc | gtg | cgg | ttc | agc | aac | aac | cct | gcc | ctg | tgc | aac | gtg | gag | 480 |
| His | Gly | Ala | Val | Arg | Phe | Ser | Asn | Asn | Pro | Ala | Leu | Cys | Asn | Val | Glu |     |
| 145 |     |     |     |     | 150 |     |     |     | 155 |     |     |     |     | 160 |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| agc | atc | cag | tgg | cgg | gac | ata | gtc | agc | agt | gac | ttt | ctc | agc | aac | atg | 528 |
| Ser | Ile | Gln | Trp | Arg | Asp | Ile | Val | Ser | Ser | Asp | Phe | Leu | Ser | Asn | Met |     |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     |     | 175 |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| tcg | atg | gac | ttc | cag | aac | cac | ctg | ggc | agc | tgc | caa | aag | tgt | gat | cca | 576 |
| Ser | Met | Asp | Phe | Gln | Asn | His | Leu | Gly | Ser | Cys | Gln | Lys | Cys | Asp | Pro |     |
|     |     | 180 |     |     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| agc | tgt | ccc | aat | ggg | agc | tgc | tgg | ggt | gca | gga | gag | gag | aac | tgc | cag | 624 |
| Ser | Cys | Pro | Asn | Gly | Ser | Cys | Trp | Gly | Ala | Gly | Glu | Glu | Asn | Cys | Gln |     |

| 195   | 200 | 205 |      |
|---|-----|-----|------|
| aaa ctg acc aaa atc atc tgt gcc cag cag tgc tcc ggg cgc tgc cgt<br>Lys Leu Thr Lys Ile Ile Cys Ala Gln Gln Cys Ser Gly Arg Cys Arg<br>210 215 220     |     |     | 672  |
| ggc aag tcc ccc agt gac tgc tgc cac aac cag tgt gct gca ggc tgc<br>Gly Lys Ser Pro Ser Asp Cys Cys His Asn Gln Cys Ala Ala Gly Cys<br>225 230 235 240 |     |     | 720  |
| aca ggc ccc cgg gag agc gac tgc ctg gtc tgc cgc aaa ttc cga gac<br>Thr Gly Pro Arg Glu Ser Asp Cys Leu Val Cys Arg Lys Phe Arg Asp<br>245 250 255     |     |     | 768  |
| gaa gcc acg tgc aag gac acc tgc ccc cca ctc atg ctc tac aac ccc<br>Glu Ala Thr Cys Lys Asp Thr Cys Pro Pro Leu Met Leu Tyr Asn Pro<br>260 265 270     |     |     | 816  |
| acc acg tac cag atg gat gtg aac ccc gag ggc aaa tac agc ttt ggt<br>Thr Thr Tyr Gln Met Asp Val Asn Pro Glu Gly Lys Tyr Ser Phe Gly<br>275 280 285     |     |     | 864  |
| gcc acc tgc gtg aag aag tgt ccc cgt aat tat gtg gtg aca gat cac<br>Ala Thr Cys Val Lys Lys Cys Pro Arg Asn Tyr Val Val Thr Asp His<br>290 295 300     |     |     | 912  |
| ggc tcg tgc gtc cga gcc tgt ggg gcc gac agc tat gag atg gag gaa<br>Gly Ser Cys Val Arg Ala Cys Gly Ala Asp Ser Tyr Glu Met Glu Glu<br>305 310 315 320 |     |     | 960  |
| gac ggc gtc cgc aag tgt aag aag tgc gaa ggg cct tgc cgc aaa gtg<br>Asp Gly Val Arg Lys Cys Lys Lys Cys Glu Gly Pro Cys Arg Lys Val<br>325 330 335     |     |     | 1008 |
| tgt aac gga ata ggt att ggt gaa ttt aaa gac tca ctc tcc ata aat<br>Cys Asn Gly Ile Gly Ile Gly Glu Phe Lys Asp Ser Leu Ser Ile Asn<br>340 345 350     |     |     | 1056 |
| gct acg aat att aaa cac ttc aaa aac tgc acc tcc atc agt ggc gat<br>Ala Thr Asn Ile Lys His Phe Lys Asn Cys Thr Ser Ile Ser Gly Asp<br>355 360 365     |     |     | 1104 |
| ctc cac atc ctg ccg gtg gca ttt agg ggt gac tcc ttc aca cat act<br>Leu His Ile Leu Pro Val Ala Phe Arg Gly Asp Ser Phe Thr His Thr<br>370 375 380     |     |     | 1152 |
| cct cct ctg gat cca cag gaa ctg gat att ctg aaa acc gta aag gaa<br>Pro Pro Leu Asp Pro Gln Glu Leu Asp Ile Leu Lys Thr Val Lys Glu<br>385 390 395 400 |     |     | 1200 |
| atc aca ggg ttt ttg ctg att cag gct tgg cct gaa aac agg acg gac<br>Ile Thr Gly Phe Leu Leu Ile Gln Ala Trp Pro Glu Asn Arg Thr Asp<br>405 410 415     |     |     | 1248 |
| ctc cat gcc ttt gag aac cta gaa atc ata cgc ggc agg acc aag caa<br>Leu His Ala Phe Glu Asn Leu Glu Ile Ile Arg Gly Arg Thr Lys Gln<br>420 425 430     |     |     | 1296 |

|   |      |
|---|------|
| cat ggt cag ttt tct ctt gca gtc gtc agc ctg aac ata aca tcc ttg | 1344 |
| His Gly Gln Phe Ser Leu Ala Val Val Ser Leu Asn Ile Thr Ser Leu |      |
| 435 440 445   |      |
| gga tta cgc tcc ctc aag gag ata agt gat gga gat gtg ata att tca | 1392 |
| Gly Leu Arg Ser Leu Lys Glu Ile Ser Asp Gly Asp Val Ile Ile Ser |      |
| 450 455 460   |      |
| gga aac aaa aat ttg tgc tat gca aat aca ata aac tgg aaa aaa ctg | 1440 |
| Gly Asn Lys Asn Leu Cys Tyr Ala Asn Thr Ile Asn Trp Lys Lys Leu |      |
| 465 470 475 480   |      |
| ttt ggg acc tcc ggt cag aaa acc aaa att ata agc aac aga ggt gaa | 1488 |
| Phe Gly Thr Ser Gly Gln Lys Thr Lys Ile Ile Ser Asn Arg Gly Glu |      |
| 485 490 495   |      |
| aac agc tgc aag gcc aca ggc cag gtc tgc cat gcc ttg tgc tcc ccc | 1536 |
| Asn Ser Cys Lys Ala Thr Gly Gln Val Cys His Ala Leu Cys Ser Pro |      |
| 500 505 510   |      |
| gag ggc tgc tgg ggc ccg gag ccc agg gac tgc gtc tct tgc cgg aat | 1584 |
| Glu Gly Cys Trp Gly Pro Glu Pro Arg Asp Cys Val Ser Cys Arg Asn |      |
| 515 520 525   |      |
| gtc agc cga ggc agg gaa tgc gtg gac aag tgc aac ctt ctg gag ggt | 1632 |
| Val Ser Arg Gly Arg Glu Cys Val Asp Lys Cys Asn Leu Leu Glu Gly |      |
| 530 535 540   |      |
| gag cca agg gag ttt gtg gag aac tct gag tgc ata cag tgc cac cca | 1680 |
| Glu Pro Arg Glu Phe Val Glu Asn Ser Glu Cys Ile Gln Cys His Pro |      |
| 545 550 555 560   |      |
| gag tgc ctg cct cag gcc atg aac atc acc tgc aca gga cgg gga cca | 1728 |
| Glu Cys Leu Pro Gln Ala Met Asn Ile Thr Cys Thr Gly Arg Gly Pro |      |
| 565 570 575   |      |
| gac aac tgt atc cag tgt gcc cac tac att gac ggc ccc cac tgc gtc | 1776 |
| Asp Asn Cys Ile Gln Cys Ala His Tyr Ile Asp Gly Pro His Cys Val |      |
| 580 585 590   |      |
| aag acc tgc ccg gca gga gtc atg gga gaa aac aac acc ctg gtc tgg | 1824 |
| Lys Thr Cys Pro Ala Gly Val Met Gly Glu Asn Asn Thr Leu Val Trp |      |
| 595 600 605   |      |
| aag tac gca gac gcc ggc cat gtg tgc cac ctg tgc cat cca aac tgc | 1872 |
| Lys Tyr Ala Asp Ala Gly His Val Cys His Leu Cys His Pro Asn Cys |      |
| 610 615 620   |      |
| acc tac gga tgc act ggg cca ggt ctt gaa ggc tgt cca acg aat ggg | 1920 |
| Thr Tyr Gly Cys Thr Gly Pro Gly Leu Glu Gly Cys Pro Thr Asn Gly |      |
| 625 630 635 640   |      |
| cct aag atc ccg tcc atc gcc act ggg atg gtg ggg gcc ctc ctc ttg | 1968 |
| Pro Lys Ile Pro Ser Ile Ala Thr Gly Met Val Gly Ala Leu Leu Leu |      |
| 645 650 655   |      |

|   |      |
|---|------|
| ctg ctg gtg gtg gcc ctg ggg atc ggc ctc ttc atg cga agg cgc cac     | 2016 |
| Leu Leu Val Val Ala Leu Gly Ile Gly Leu Phe Met Arg Arg Arg His     |      |
| 660 665 670   |      |
| atc gtt cgg aag cgc acg ctg cgg agg ctg ctg cag gag agg gag ctt     | 2064 |
| Ile Val Arg Lys Arg Thr Leu Arg Arg Leu Leu Gln Glu Arg Glu Leu     |      |
| 675 680 685   |      |
| gtg gag cct ctt aca ccc agt gga gaa gct ccc aac caa gct ctc ttg     | 2112 |
| Val Glu Ala Pro Leu Thr Pro Ser Gly Glu Ala Pro Asn Gln Ala Leu Leu |      |
| 690 695 700   |      |
| agg atc ttg aag gaa act gaa ttc aaa aag atc aaa gtg ctg ggc tcc     | 2160 |
| Arg Ile Leu Lys Glu Thr Glu Phe Lys Lys Ile Lys Val Leu Gly Ser     |      |
| 705 710 715 720   |      |
| ggt gcg ttc ggc acg gtg tat aag gga ctc tgg atc cca gaa ggt gag     | 2208 |
| Gly Ala Phe Gly Thr Val Tyr Lys Gly Leu Trp Ile Pro Glu Gly Glu     |      |
| 725 730 735   |      |
| aaa gtt aaa att ccc gtc gct atc aag gaa tta aga gaa gca aca tct     | 2256 |
| Lys Val Lys Ile Pro Val Ala Ile Lys Glu Leu Arg Glu Ala Thr Ser     |      |
| 740 745 750   |      |
| ccg aaa gcc aac aag gaa atc ctc gat gaa gcc tac gtg atg gcc agc     | 2304 |
| Pro Lys Ala Asn Lys Glu Ile Leu Asp Glu Ala Tyr Val Met Ala Ser     |      |
| 755 760 765   |      |
| gtg gac aac ccc cac gtg tgc cgc ctg ctg ggc atc tgc ctc acc tcc     | 2352 |
| Val Asp Asn Pro His Val Cys Arg Leu Leu Gly Ile Cys Leu Thr Ser     |      |
| 770 775 780   |      |
| acc gtg cag ctc atc acg cag ctc atg ccc ttc ggc tgc ctc ctg gac     | 2400 |
| Thr Val Gln Leu Ile Thr Gln Leu Met Pro Phe Gly Cys Leu Leu Asp     |      |
| 785 790 795 800   |      |
| tat gtc cgg gaa cac aaa gac aat att ggc tcc cag tac ctg ctc aac     | 2448 |
| Tyr Val Arg Glu His Lys Asp Asn Ile Gly Ser Gln Tyr Leu Leu Asn     |      |
| 805 810 815   |      |
| tgg tgt gtg cag atc gca aag ggc atg aac tac ttg gag gac cgt cgc     | 2496 |
| Trp Cys Val Gln Ile Ala Lys Gly Met Asn Tyr Leu Glu Asp Arg Arg     |      |
| 820 825 830   |      |
| ttg gtg cac cgc gac ctg gca gcc agg aac gta ctg gtg aaa aca ccg     | 2544 |
| Leu Val His Arg Asp Leu Ala Ala Arg Asn Val Leu Val Lys Thr Pro     |      |
| 835 840 845   |      |
| cag cat gtc aag atc aca gat ttt ggg ctg gcc aaa ctg ctg ggt gcg     | 2592 |
| Gln His Val Lys Ile Thr Asp Phe Gly Leu Ala Lys Leu Leu Gly Ala     |      |
| 850 855 860   |      |
| gaa gag aaa gaa tac cat gca gaa gga ggc aaa gtg cct atc aag tgg     | 2640 |
| Glu Glu Lys Glu Tyr His Ala Glu Gly Gly Lys Val Pro Ile Lys Trp     |      |
| 865 870 875 880   |      |
| atg gca ttg gaa tca att tta cac aga atc tat acc cac cag agt gat     | 2688 |

|      |      |      |     |      |      |      |      |      |     |      |      |      |      |     |     |      |  |
|------|------|------|-----|------|------|------|------|------|-----|------|------|------|------|-----|-----|------|--|
| Met  | Ala  | Leu  | Glu | Ser  | Ile  | Leu  | His  | Arg  | Ile | Tyr  | Thr  | His  | Gln  | Ser | Asp |      |  |
|      |      |      |     | 885  |      |      |      |      | 890 |      |      |      |      | 895 |     |      |  |
| gtc  | tgg  | agc  | tac | ggg  | gtg  | acc  | gtt  | tgg  | gag | ttg  | atg  | acc  | ttt  | gga | tcc | 2736 |  |
| Val  | Trp  | Ser  | Tyr | Gly  | Val  | Thr  | Val  | Trp  | Glu | Leu  | Met  | Thr  | Phe  | Gly | Ser |      |  |
|      |      |      | 900 |      |      |      |      | 905  |     |      |      |      | 910  |     |     |      |  |
| aag  | cca  | tat  | gac | gga  | atc  | cct  | gcc  | agc  | gag | atc  | tcc  | tcc  | atc  | ctg | gag | 2784 |  |
| Lys  | Pro  | Tyr  | Asp | Gly  | Ile  | Pro  | Ala  | Ser  | Glu | Ile  | Ser  | Ser  | Ile  | Leu | Glu |      |  |
|      |      | 915  |     |      |      |      | 920  |      |     |      |      | 925  |      |     |     |      |  |
| aaa  | gga  | gaa  | cgc | ctc  | cct  | cag  | cca  | ccc  | ata | tgt  | acc  | atc  | gat  | gtc | tac | 2832 |  |
| Lys  | Gly  | Glu  | Arg | Leu  | Pro  | Gln  | Pro  | Pro  | Ile | Cys  | Thr  | Ile  | Asp  | Val | Tyr |      |  |
|      | 930  |      |     |      |      | 935  |      |      |     |      | 940  |      |      |     |     |      |  |
| atg  | atc  | atg  | gtc | aag  | tgc  | tgg  | atg  | ata  | gac | gca  | gat  | agt  | cgc  | cca | aag | 2880 |  |
| Met  | Ile  | Met  | Val | Lys  | Cys  | Trp  | Met  | Ile  | Asp | Ala  | Asp  | Ser  | Arg  | Pro | Lys |      |  |
| 945  |      |      |     |      | 950  |      |      |      | 955 |      |      |      |      |     | 960 |      |  |
| ttc  | cgt  | gag  | ttg | atc  | atc  | gaa  | ttc  | tcc  | aaa | atg  | gcc  | cga  | gac  | ccc | cag | 2928 |  |
| Phe  | Arg  | Glu  | Leu | Ile  | Ile  | Glu  | Phe  | Ser  | Lys | Met  | Ala  | Arg  | Asp  | Pro | Gln |      |  |
|      |      |      | 965 |      |      |      |      | 970  |     |      |      |      |      | 975 |     |      |  |
| cgc  | tac  | ctt  | gtc | att  | cag  | ggg  | gat  | gaa  | aga | atg  | cat  | ttg  | cca  | agt | cct | 2976 |  |
| Arg  | Tyr  | Leu  | Val | Ile  | Gln  | Gly  | Asp  | Glu  | Arg | Met  | His  | Leu  | Pro  | Ser | Pro |      |  |
|      |      | 980  |     |      |      |      |      | 985  |     |      |      |      | 990  |     |     |      |  |
| aca  | gac  | tcc  | aac | ttc  | tac  | cgt  | gcc  | ctg  | atg | gat  | gaa  | gaa  | gac  | atg | gac | 3024 |  |
| Thr  | Asp  | Ser  | Asn | Phe  | Tyr  | Arg  | Ala  | Leu  | Met | Asp  | Glu  | Glu  | Asp  | Met | Asp |      |  |
|      |      | 995  |     |      |      |      | 1000 |      |     |      | 1005 |      |      |     |     |      |  |
| gac  | gtg  | gtg  | gat | gcc  | gac  | gag  | tac  | ctc  | atc | cca  | cag  | cag  | ggc  | ttc | ttc | 3072 |  |
| Asp  | Val  | Val  | Asp | Ala  | Asp  | Glu  | Tyr  | Leu  | Ile | Pro  | Gln  | Gln  | Gly  | Phe | Phe |      |  |
|      | 1010 |      |     |      |      | 1015 |      |      |     | 1020 |      |      |      |     |     |      |  |
| agc  | agc  | ccc  | tcc | acg  | tca  | cgg  | act  | ccc  | ctc | ctg  | agc  | tct  | ctg  | agt | gca | 3120 |  |
| Ser  | Ser  | Pro  | Ser | Thr  | Ser  | Arg  | Thr  | Pro  | Leu | Leu  | Ser  | Ser  | Leu  | Ser | Ala |      |  |
| 1025 |      |      |     | 1030 |      |      |      | 1035 |     |      |      |      | 1040 |     |     |      |  |
| acc  | agc  | aac  | aat | tcc  | acc  | gtg  | gct  | tgc  | att | gat  | aga  | aat  | ggg  | ctg | caa | 3168 |  |
| Thr  | Ser  | Asn  | Asn | Ser  | Thr  | Val  | Ala  | Cys  | Ile | Asp  | Arg  | Asn  | Gly  | Leu | Gln |      |  |
|      |      | 1045 |     |      |      |      |      | 1050 |     |      |      |      | 1055 |     |     |      |  |
| agc  | tgt  | ccc  | atc | aag  | gaa  | gac  | agc  | ttc  | ttg | cag  | cga  | tac  | agc  | tca | gac | 3216 |  |
| Ser  | Cys  | Pro  | Ile | Lys  | Glu  | Asp  | Ser  | Phe  | Leu | Gln  | Arg  | Tyr  | Ser  | Ser | Asp |      |  |
|      |      | 1060 |     |      |      |      | 1065 |      |     |      |      | 1070 |      |     |     |      |  |
| ccc  | aca  | ggc  | gcc | ttg  | act  | gag  | gac  | agc  | ata | gac  | gac  | acc  | ttc  | ctc | cca | 3264 |  |
| Pro  | Thr  | Gly  | Ala | Leu  | Thr  | Glu  | Asp  | Ser  | Ile | Asp  | Asp  | Thr  | Phe  | Leu | Pro |      |  |
|      | 1075 |      |     |      |      | 1080 |      |      |     |      | 1085 |      |      |     |     |      |  |
| gtg  | cct  | gaa  | tac | ata  | aac  | cag  | tcc  | gtt  | ccc | aaa  | agg  | ccc  | gct  | ggc | tct | 3312 |  |
| Val  | Pro  | Glu  | Tyr | Ile  | Asn  | Gln  | Ser  | Val  | Pro | Lys  | Arg  | Pro  | Ala  | Gly | Ser |      |  |
|      | 1090 |      |     |      | 1095 |      |      | 1100 |     |      |      |      |      |     |     |      |  |
| gtg  | cag  | aat  | cct | gtc  | tat  | cac  | aat  | cag  | cct | ctg  | aac  | ccc  | gcg  | ccc | agc | 3360 |  |
| Val  | Gln  | Asn  | Pro | Val  | Tyr  | His  | Asn  | Gln  | Pro | Leu  | Asn  | Pro  | Ala  | Pro | Ser |      |  |

| 1105  | 1110 | 1115 | 1120 |      |
|---|------|------|------|------|
| aga gac cca cac tac cag gac ccc cac agc act gca gtg ggc aac ccc |      |      |      | 3408 |
| Arg Asp Pro His Tyr Gln Asp Pro His Ser Thr Ala Val Gly Asn Pro |      |      |      |      |
| 1125  |      | 1130 | 1135 |      |
| gag tat ctc aac act gtc cag ccc acc tgt gtc aac agc aca ttc gac |      |      |      | 3456 |
| Glu Tyr Leu Asn Thr Val Gln Pro Thr Cys Val Asn Ser Thr Phe Asp |      |      |      |      |
| 1140  |      | 1145 | 1150 |      |
| agc cct gcc cac tgg gcc cag aaa ggc agc cac caa att agc ctg gac |      |      |      | 3504 |
| Ser Pro Ala His Trp Ala Gln Lys Gly Ser His Gln Ile Ser Leu Asp |      |      |      |      |
| 1155  |      | 1160 | 1165 |      |
| aac cct gac tac cag cag gac ttc ttt ccc aag gaa gcc aag cca aat |      |      |      | 3552 |
| Asn Pro Asp Tyr Gln Gln Asp Phe Phe Pro Lys Glu Ala Lys Pro Asn |      |      |      |      |
| 1170  |      | 1175 | 1180 |      |
| ggc atc ttt aag ggc tcc aca gct gaa aat gca gaa tac cta agg gtc |      |      |      | 3600 |
| Gly Ile Phe Lys Gly Ser Thr Ala Glu Asn Ala Glu Tyr Leu Arg Val |      |      |      |      |
| 1185  |      | 1190 | 1195 | 1200 |
| gcg cca caa agc agt gaa ttt att gga gca                         |      |      |      | 3630 |
| Ala Pro Gln Ser Ser Glu Phe Ile Gly Ala                         |      |      |      |      |
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 <213> Homo sapiens

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| Ala Leu Cys Pro Ala Ser Arg Ala Leu Glu Glu Lys Lys Val Cys Gln |    |    |    |  |
| 20  | 25 | 30 |    |  |
| Gly Thr Ser Asn Lys Leu Thr Gln Leu Gly Thr Phe Glu Asp His Phe |    |    |    |  |
| 35  | 40 | 45 |    |  |
| Leu Ser Leu Gln Arg Met Phe Asn Asn Cys Glu Val Val Leu Gly Asn |    |    |    |  |
| 50  | 55 | 60 |    |  |
| Leu Glu Ile Thr Tyr Val Gln Arg Asn Tyr Asp Leu Ser Phe Leu Lys |    |    |    |  |
| 65  | 70 | 75 | 80 |  |
| Thr Ile Gln Glu Val Ala Gly Tyr Val Leu Ile Ala Leu Asn Thr Val |    |    |    |  |
| 85  | 90 | 95 |    |  |



Glu Arg Ile Pro Leu Glu Asn Leu Gln Ile Ile Arg Gly Asn Met Tyr  
 100 105 110

Tyr Glu Asn Ser Tyr Ala Leu Ala Val Leu Ser Asn Tyr Asp Ala Asn  
 115 120 125

Lys Thr Gly Leu Lys Glu Leu Pro Met Arg Asn Leu Gln Glu Ile Leu  
 130 135 140

His Gly Ala Val Arg Phe Ser Asn Asn Pro Ala Leu Cys Asn Val Glu  
 145 150 155 160

Ser Ile Gln Trp Arg Asp Ile Val Ser Ser Asp Phe Leu Ser Asn Met  
 165 170 175

Ser Met Asp Phe Gln Asn His Leu Gly Ser Cys Gln Lys Cys Asp Pro  
 180 185 190

Ser Cys Pro Asn Gly Ser Cys Trp Gly Ala Gly Glu Glu Asn Cys Gln  
 195 200 205

Lys Leu Thr Lys Ile Ile Cys Ala Gln Gln Cys Ser Gly Arg Cys Arg  
 210 215 220

Gly Lys Ser Pro Ser Asp Cys Cys His Asn Gln Cys Ala Ala Gly Cys  
 225 230 235 240

Thr Gly Pro Arg Glu Ser Asp Cys Leu Val Cys Arg Lys Phe Arg Asp  
 245 250 255

Glu Ala Thr Cys Lys Asp Thr Cys Pro Pro Leu Met Leu Tyr Asn Pro  
 260 265 270

Thr Thr Tyr Gln Met Asp Val Asn Pro Glu Gly Lys Tyr Ser Phe Gly  
 275 280 285

Ala Thr Cys Val Lys Lys Cys Pro Arg Asn Tyr Val Val Thr Asp His  
 290 295 300

Gly Ser Cys Val Arg Ala Cys Gly Ala Asp Ser Tyr Glu Met Glu Glu  
 305 310 315 320

Asp Gly Val Arg Lys Cys Lys Lys Cys Glu Gly Pro Cys Arg Lys Val  
 325 330 335

Cys Asn Gly Ile Gly Ile Gly Glu Phe Lys Asp Ser Leu Ser Ile Asn  
 340 345 350

Ala Thr Asn Ile Lys His Phe Lys Asn Cys Thr Ser Ile Ser Gly Asp  
 355 360 365

Leu His Ile Leu Pro Val Ala Phe Arg Gly Asp Ser Phe Thr His Thr  
 370 375 380

Pro Pro Leu Asp Pro Gln Glu Leu Asp Ile Leu Lys Thr Val Lys Glu  
 385 390 395 400

Ile Thr Gly Phe Leu Leu Ile Gln Ala Trp Pro Glu Asn Arg Thr Asp  
 405 410 415

Leu His Ala Phe Glu Asn Leu Glu Ile Ile Arg Gly Arg Thr Lys Gln  
 420 425 430

His Gly Gln Phe Ser Leu Ala Val Val Ser Leu Asn Ile Thr Ser Leu  
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Gly Leu Arg Ser Leu Lys Glu Ile Ser Asp Gly Asp Val Ile Ile Ser  
 450 455 460

Gly Asn Lys Asn Leu Cys Tyr Ala Asn Thr Ile Asn Trp Lys Lys Leu  
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Phe Gly Thr Ser Gly Gln Lys Thr Lys Ile Ile Ser Asn Arg Gly Glu  
 485 490 495

Asn Ser Cys Lys Ala Thr Gly Gln Val Cys His Ala Leu Cys Ser Pro  
 500 505 510

Glu Gly Cys Trp Gly Pro Glu Pro Arg Asp Cys Val Ser Cys Arg Asn  
 515 520 525

Val Ser Arg Gly Arg Glu Cys Val Asp Lys Cys Asn Leu Leu Glu Gly  
 530 535 540

Glu Pro Arg Glu Phe Val Glu Asn Ser Glu Cys Ile Gln Cys His Pro

|                 |   |     |  |     |  |     |
|-----------------|---|-----|--|-----|--|-----|
| 545             |   | 550 |  | 555 |  | 560 |
| Glu Cys Leu Pro | Gln Ala Met Asn Ile Thr Cys Thr Gly Arg Gly Pro | 565 |  | 570 |  | 575 |
| Asp Asn Cys Ile | Gln Cys Ala His Tyr Ile Asp Gly Pro His Cys Val | 580 |  | 585 |  | 590 |
| Lys Thr Cys Pro | Ala Gly Val Met Gly Glu Asn Asn Thr Leu Val Trp | 595 |  | 600 |  | 605 |
| Lys Tyr Ala Asp | Ala Gly His Val Cys His Leu Cys His Pro Asn Cys | 610 |  | 615 |  | 620 |
| Thr Tyr Gly Cys | Thr Gly Pro Gly Leu Glu Gly Cys Pro Thr Asn Gly | 625 |  | 630 |  | 635 |
| Pro Lys Ile Pro | Ser Ile Ala Thr Gly Met Val Gly Ala Leu Leu Leu | 645 |  | 650 |  | 655 |
| Leu Leu Val Val | Ala Leu Gly Ile Gly Leu Phe Met Arg Arg Arg His | 660 |  | 665 |  | 670 |
| Ile Val Arg Lys | Arg Thr Leu Arg Arg Leu Leu Gln Glu Arg Glu Leu | 675 |  | 680 |  | 685 |
| Val Glu Pro Leu | Thr Pro Ser Gly Glu Ala Pro Asn Gln Ala Leu Leu | 690 |  | 695 |  | 700 |
| Arg Ile Leu Lys | Glu Thr Glu Phe Lys Lys Ile Lys Val Leu Gly Ser | 705 |  | 710 |  | 715 |
| Gly Ala Phe Gly | Thr Val Tyr Lys Gly Leu Trp Ile Pro Glu Gly Glu | 725 |  | 730 |  | 735 |
| Lys Val Lys Ile | Pro Val Ala Ile Lys Glu Leu Arg Glu Ala Thr Ser | 740 |  | 745 |  | 750 |
| Pro Lys Ala Asn | Lys Glu Ile Leu Asp Glu Ala Tyr Val Met Ala Ser | 755 |  | 760 |  | 765 |
| Val Asp Asn Pro | His Val Cys Arg Leu Leu Gly Ile Cys Leu Thr Ser | 770 |  | 775 |  | 780 |

Thr Val Gln Leu Ile Thr Gln Leu Met Pro Phe Gly Cys Leu Leu Asp  
 785 790 795 800

Tyr Val Arg Glu His Lys Asp Asn Ile Gly Ser Gln Tyr Leu Leu Asn  
 805 810 815

Trp Cys Val Gln Ile Ala Lys Gly Met Asn Tyr Leu Glu Asp Arg Arg  
 820 825 830

Leu Val His Arg Asp Leu Ala Ala Arg Asn Val Leu Val Lys Thr Pro  
 835 840 845

Gln His Val Lys Ile Thr Asp Phe Gly Leu Ala Lys Leu Leu Gly Ala  
 850 855 860

Glu Glu Lys Glu Tyr His Ala Glu Gly Gly Lys Val Pro Ile Lys Trp  
 865 870 875 880

Met Ala Leu Glu Ser Ile Leu His Arg Ile Tyr Thr His Gln Ser Asp  
 885 890 895

Val Trp Ser Tyr Gly Val Thr Val Trp Glu Leu Met Thr Phe Gly Ser  
 900 905 910

Lys Pro Tyr Asp Gly Ile Pro Ala Ser Glu Ile Ser Ser Ile Leu Glu  
 915 920 925

Lys Gly Glu Arg Leu Pro Gln Pro Pro Ile Cys Thr Ile Asp Val Tyr  
 930 935 940

Met Ile Met Val Lys Cys Trp Met Ile Asp Ala Asp Ser Arg Pro Lys  
 945 950 955 960

Phe Arg Glu Leu Ile Ile Glu Phe Ser Lys Met Ala Arg Asp Pro Gln  
 965 970 975

Arg Tyr Leu Val Ile Gln Gly Asp Glu Arg Met His Leu Pro Ser Pro  
 980 985 990

Thr Asp Ser Asn Phe Tyr Arg Ala Leu Met Asp Glu Glu Asp Met Asp  
 995 1000 1005

|      |     |     |     |     |     |      |     |     |     |     |      |     |     |     |
|------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|
| Asp  | Val | Val | Asp | Ala | Asp | Glu  | Tyr | Leu | Ile | Pro | Gln  | Gln | Gly | Phe |
| 1010 |     |     |     |     |     | 1015 |     |     |     |     | 1020 |     |     |     |
| Phe  | Ser | Ser | Pro | Ser | Thr | Ser  | Arg | Thr | Pro | Leu | Leu  | Ser | Ser | Leu |
| 1025 |     |     |     |     |     | 1030 |     |     |     |     | 1035 |     |     |     |
| Ser  | Ala | Thr | Ser | Asn | Asn | Ser  | Thr | Val | Ala | Cys | Ile  | Asp | Arg | Asn |
| 1040 |     |     |     |     |     | 1045 |     |     |     |     | 1050 |     |     |     |
| Gly  | Leu | Gln | Ser | Cys | Pro | Ile  | Lys | Glu | Asp | Ser | Phe  | Leu | Gln | Arg |
| 1055 |     |     |     |     |     | 1060 |     |     |     |     | 1065 |     |     |     |
| Tyr  | Ser | Ser | Asp | Pro | Thr | Gly  | Ala | Leu | Thr | Glu | Asp  | Ser | Ile | Asp |
| 1070 |     |     |     |     |     | 1075 |     |     |     |     | 1080 |     |     |     |
| Asp  | Thr | Phe | Leu | Pro | Val | Pro  | Glu | Tyr | Ile | Asn | Gln  | Ser | Val | Pro |
| 1085 |     |     |     |     |     | 1090 |     |     |     |     | 1095 |     |     |     |
| Lys  | Arg | Pro | Ala | Gly | Ser | Val  | Gln | Asn | Pro | Val | Tyr  | His | Asn | Gln |
| 1100 |     |     |     |     |     | 1105 |     |     |     |     | 1110 |     |     |     |
| Pro  | Leu | Asn | Pro | Ala | Pro | Ser  | Arg | Asp | Pro | His | Tyr  | Gln | Asp | Pro |
| 1115 |     |     |     |     |     | 1120 |     |     |     |     | 1125 |     |     |     |
| His  | Ser | Thr | Ala | Val | Gly | Asn  | Pro | Glu | Tyr | Leu | Asn  | Thr | Val | Gln |
| 1130 |     |     |     |     |     | 1135 |     |     |     |     | 1140 |     |     |     |
| Pro  | Thr | Cys | Val | Asn | Ser | Thr  | Phe | Asp | Ser | Pro | Ala  | His | Trp | Ala |
| 1145 |     |     |     |     |     | 1150 |     |     |     |     | 1155 |     |     |     |
| Gln  | Lys | Gly | Ser | His | Gln | Ile  | Ser | Leu | Asp | Asn | Pro  | Asp | Tyr | Gln |
| 1160 |     |     |     |     |     | 1165 |     |     |     |     | 1170 |     |     |     |
| Gln  | Asp | Phe | Phe | Pro | Lys | Glu  | Ala | Lys | Pro | Asn | Gly  | Ile | Phe | Lys |
| 1175 |     |     |     |     |     | 1180 |     |     |     |     | 1185 |     |     |     |
| Gly  | Ser | Thr | Ala | Glu | Asn | Ala  | Glu | Tyr | Leu | Arg | Val  | Ala | Pro | Gln |
| 1190 |     |     |     |     |     | 1195 |     |     |     |     | 1200 |     |     |     |
| Ser  | Ser | Glu | Phe | Ile | Gly | Ala  |     |     |     |     |      |     |     |     |
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 Met Arg Pro  
 1  
 tcc ggg acg gcc ggg gca gcg ctc ctg gcg ctg ctg gct gcg ctc tgc 223  
 Ser Gly Thr Ala Gly Ala Ala Leu Leu Ala Leu Leu Ala Ala Leu Cys  
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 ccg gcg agt cgg gct ctg gag gaa aag aaa gtt tgc caa ggc acg agt 271  
 Pro Ala Ser Arg Ala Leu Glu Glu Lys Lys Val Cys Gln Gly Thr Ser  
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 Asn Lys Leu Thr Gln Leu Gly Thr Phe Glu Asp His Phe Leu Ser Leu  
 40 45 50  
 cag agg atg ttc aat aac tgt gag gtg gtc ctt ggg aat ttg gaa att 367  
 Gln Arg Met Phe Asn Asn Cys Glu Val Val Leu Gly Asn Leu Glu Ile  
 55 60 65  
 acc tat gtg cag agg aat tat gat ctt tcc ttc tta aag acc atc cag 415  
 Thr Tyr Val Gln Arg Asn Tyr Asp Leu Ser Phe Leu Lys Thr Ile Gln  
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 Glu Val Ala Gly Tyr Val Leu Ile Ala Leu Asn Thr Val Glu Arg Ile  
 85 90 95  
 cct ttg gaa aac ctg cag atc atc aga gga aat atg tac tac gaa aat 511  
 Pro Leu Glu Asn Leu Gln Ile Ile Arg Gly Asn Met Tyr Tyr Glu Asn  
 100 105 110 115  
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 Ser Tyr Ala Leu Ala Val Leu Ser Asn Tyr Asp Ala Asn Lys Thr Gly  
 120 125 130  
 ctg aag gag ctg ccc atg aga aat tta cag gaa atc ctg cat ggc gcc 607  
 Leu Lys Glu Leu Pro Met Arg Asn Leu Gln Glu Ile Leu His Gly Ala  
 135 140 145

|   |      |
|---|------|
| gtg cgg ttc agc aac aac cct gcc ctg tgc aac gtg gag agc atc cag | 655  |
| Val Arg Phe Ser Asn Asn Pro Ala Leu Cys Asn Val Glu Ser Ile Gln |      |
| 150 155 160   |      |
| tgg cgg gac ata gtc agc agt gac ttt ctc agc aac atg tcg atg gac | 703  |
| Trp Arg Asp Ile Val Ser Ser Asp Phe Leu Ser Asn Met Ser Met Asp |      |
| 165 170 175   |      |
| ttc cag aac cac ctg ggc agc tgc caa aag tgt gat cca agc tgt ccc | 751  |
| Phe Gln Asn His Leu Gly Ser Cys Gln Lys Cys Asp Pro Ser Cys Pro |      |
| 180 185 190 195   |      |
| aat ggg agc tgc tgg ggt gca gga gag gag aac tgc cag aaa ctg acc | 799  |
| Asn Gly Ser Cys Trp Gly Ala Gly Glu Glu Asn Cys Gln Lys Leu Thr |      |
| 200 205 210   |      |
| aaa atc atc tgt gcc cag cag tgc tcc ggg cgc tgc cgt ggc aag tcc | 847  |
| Lys Ile Ile Cys Ala Gln Gln Cys Ser Gly Arg Cys Arg Gly Lys Ser |      |
| 215 220 225   |      |
| ccc agt gac tgc tgc cac aac cag tgt gct gca ggc tgc aca ggc ccc | 895  |
| Pro Ser Asp Cys Cys His Asn Gln Cys Ala Ala Gly Cys Thr Gly Pro |      |
| 230 235 240   |      |
| cgg gag agc gac tgc ctg gtc tgc cgc aaa ttc cga gac gaa gcc acg | 943  |
| Arg Glu Ser Asp Cys Leu Val Cys Arg Lys Phe Arg Asp Glu Ala Thr |      |
| 245 250 255   |      |
| tgc aag gac acc tgc ccc cca ctc atg ctc tac aac ccc acc acg tac | 991  |
| Cys Lys Asp Thr Cys Pro Pro Leu Met Leu Tyr Asn Pro Thr Thr Tyr |      |
| 260 265 270 275   |      |
| cag atg gat gtg aac ccc gag ggc aaa tac agc ttt ggt gcc acc tgc | 1039 |
| Gln Met Asp Val Asn Pro Glu Gly Lys Tyr Ser Phe Gly Ala Thr Cys |      |
| 280 285 290   |      |
| gtg aag aag tgt ccc cgt aat tat gtg gtg aca gat cac ggc tcg tgc | 1087 |
| Val Lys Lys Cys Pro Arg Asn Tyr Val Val Thr Asp His Gly Ser Cys |      |
| 295 300 305   |      |
| gtc cga gcc tgt ggg gcc gac agc tat gag atg gag gaa gac ggc gtc | 1135 |
| Val Arg Ala Cys Gly Ala Asp Ser Tyr Glu Met Glu Glu Asp Gly Val |      |
| 310 315 320   |      |
| cgc aag tgt aag aag tgc gaa ggg cct tgc cgc aaa gtg tgt aac gga | 1183 |
| Arg Lys Cys Lys Lys Cys Glu Gly Pro Cys Arg Lys Val Cys Asn Gly |      |
| 325 330 335   |      |
| ata ggt att ggt gaa ttt aaa gac tca ctc tcc ata aat gct acg aat | 1231 |
| Ile Gly Ile Gly Glu Phe Lys Asp Ser Leu Ser Ile Asn Ala Thr Asn |      |
| 340 345 350 355   |      |
| att aaa cac ttc aaa aac tgc acc tcc atc agt ggc gat ctc cac atc | 1279 |
| Ile Lys His Phe Lys Asn Cys Thr Ser Ile Ser Gly Asp Leu His Ile |      |
| 360 365 370   |      |

|   |      |
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| ctg ccg gtg gca ttt agg ggt gac tcc ttc aca cat act cct cct ctg | 1327 |
| Leu Pro Val Ala Phe Arg Gly Asp Ser Phe Thr His Thr Pro Pro Leu |      |
| 375 380 385   |      |
| gat cca cag gaa ctg gat att ctg aaa acc gta aag gaa atc aca ggg | 1375 |
| Asp Pro Gln Glu Leu Asp Ile Leu Lys Thr Val Lys Glu Ile Thr Gly |      |
| 390 395 400   |      |
| ttt ttg ctg att cag gct tgg cct gaa aac agg acg gac ctc cat gcc | 1423 |
| Phe Leu Leu Ile Gln Ala Trp Pro Glu Asn Arg Thr Asp Leu His Ala |      |
| 405 410 415   |      |
| ttt gag aac cta gaa atc ata cgc ggc agg acc aag caa cat ggt cag | 1471 |
| Phe Glu Asn Leu Glu Ile Ile Arg Gly Arg Thr Lys Gln His Gly Gln |      |
| 420 425 430 435   |      |
| ttt tct ctt gca gtc gtc agc ctg aac ata aca tcc ttg gga tta cgc | 1519 |
| Phe Ser Leu Ala Val Val Ser Leu Asn Ile Thr Ser Leu Gly Leu Arg |      |
| 440 445 450   |      |
| tcc ctc aag gag ata agt gat gga gat gtg ata att tca gga aac aaa | 1567 |
| Ser Leu Lys Glu Ile Ser Asp Gly Asp Val Ile Ile Ser Gly Asn Lys |      |
| 455 460 465   |      |
| aat ttg tgc tat gca aat aca ata aac tgg aaa aaa ctg ttt ggg acc | 1615 |
| Asn Leu Cys Tyr Ala Asn Thr Ile Asn Trp Lys Lys Leu Phe Gly Thr |      |
| 470 475 480   |      |
| tcc ggt cag aaa acc aaa att ata agc aac aga ggt gaa aac agc tgc | 1663 |
| Ser Gly Gln Lys Thr Lys Ile Ile Ser Asn Arg Gly Glu Asn Ser Cys |      |
| 485 490 495   |      |
| aag gcc aca ggc cag gtc tgc cat gcc ttg tgc tcc ccc gag ggc tgc | 1711 |
| Lys Ala Thr Gly Gln Val Cys His Ala Leu Cys Ser Pro Glu Gly Cys |      |
| 500 505 510 515   |      |
| tgg ggc ccg gag ccc agg gac tgc gtc tct tgc cgg aat gtc agc cga | 1759 |
| Trp Gly Pro Glu Pro Arg Asp Cys Val Ser Cys Arg Asn Val Ser Arg |      |
| 520 525 530   |      |
| ggc agg gaa tgc gtg gac aag tgc aac ctt ctg gag ggt gag cca agg | 1807 |
| Gly Arg Glu Cys Val Asp Lys Cys Asn Leu Leu Glu Gly Glu Pro Arg |      |
| 535 540 545   |      |
| gag ttt gtg gag aac tct gag tgc ata cag tgc cac cca gag tgc ctg | 1855 |
| Glu Phe Val Glu Asn Ser Glu Cys Ile Gln Cys His Pro Glu Cys Leu |      |
| 550 555 560   |      |
| cct cag gcc atg aac atc acc tgc aca gga cgg gga cca gac aac tgt | 1903 |
| Pro Gln Ala Met Asn Ile Thr Cys Thr Gly Arg Gly Pro Asp Asn Cys |      |
| 565 570 575   |      |
| atc cag tgt gcc cac tac att gac ggc ccc cac tgc gtc aag acc tgc | 1951 |
| Ile Gln Cys Ala His Tyr Ile Asp Gly Pro His Cys Val Lys Thr Cys |      |
| 580 585 590 595   |      |
| ccg gca gga gtc atg gga gaa aac aac acc ctg gtc tgg aag tac gca | 1999 |



|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--|
| Pro | Ala | Gly | Val | Met | Gly | Glu | Asn | Asn | Thr | Leu | Val | Trp | Lys | Tyr | Ala |      |  |
|     |     |     |     | 600 |     |     |     |     | 605 |     |     |     |     |     | 610 |      |  |
| gac | gcc | ggc | cat | gtg | tgc | cac | ctg | tgc | cat | cca | aac | tgc | acc | tac | gga | 2047 |  |
| Asp | Ala | Gly | His | Val | Cys | His | Leu | Cys | His | Pro | Asn | Cys | Thr | Tyr | Gly |      |  |
|     |     |     | 615 |     |     |     |     | 620 |     |     |     |     | 625 |     |     |      |  |
| tgc | act | ggg | cca | ggg | ctt | gaa | ggc | tgt | cca | acg | aat | ggg | cct | aag | atc | 2095 |  |
| Cys | Thr |     | Pro | Gly | Leu | Glu | Gly | Cys | Pro | Thr | Asn | Gly | Pro | Lys | Ile |      |  |
|     |     |     | 630 |     |     |     |     | 635 |     |     |     |     | 640 |     |     |      |  |
| ccg | tcc | atc | gcc | act | ggg | atg | gtg | ggg | gcc | ctc | ctc | ttg | ctg | ctg | gtg | 2143 |  |
| Pro | Ser | Ile | Ala | Thr | Gly | Met | Val | Gly | Ala | Leu | Leu | Leu | Leu | Leu | Val |      |  |
|     |     |     | 645 |     |     |     |     | 650 |     |     |     |     | 655 |     |     |      |  |
| gtg | gcc | ctg | ggg | atc | ggc | ctc | ttc | atg | cga | agg | cgc | cac | atc | gtt | cgg | 2191 |  |
| Val | Ala | Leu | Gly | Ile | Gly | Leu | Phe | Met | Arg | Arg | Arg | His | Ile | Val | Arg |      |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | 660  |  |
| aag | cgc | acg | ctg | cgg | agg | ctg | ctg | cag | gag | agg | gag | ctt | gtg | gag | cct | 2239 |  |
| Lys | Arg | Thr | Leu | Arg | Arg | Leu | Leu | Gln | Glu | Arg | Glu | Leu | Val | Glu | Pro |      |  |
|     |     |     |     | 680 |     |     |     |     |     |     |     |     |     |     | 690 |      |  |
| ctt | aca | ccc | agt | gga | gaa | gct | ccc | aac | caa | gct | ctc | ttg | agg | atc | ttg | 2287 |  |
| Leu | Thr | Pro | Ser | Gly | Glu | Ala | Pro | Asn | Gln | Ala | Leu | Leu | Arg | Ile | Leu |      |  |
|     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     | 705 |     |      |  |
| aag | gaa | act | gaa | ttc | aaa | aag | atc | aaa | gtg | ctg | ggc | tcc | ggg | gcg | ttc | 2335 |  |
| Lys | Glu | Thr | Glu | Phe | Lys | Lys | Ile | Lys | Val | Leu | Gly | Ser | Gly | Ala | Phe |      |  |
|     |     |     |     | 710 |     |     |     |     |     |     |     |     |     |     | 720 |      |  |
| ggc | acg | gtg | tat | aag | gga | ctc | tgg | atc | cca | gaa | ggg | gag | aaa | gtt | aaa | 2383 |  |
| Gly | Thr | Val | Tyr | Lys | Gly | Leu | Trp | Ile | Pro | Glu | Gly | Glu | Lys | Val | Lys |      |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | 725  |  |
| att | ccc | gtc | gct | atc | aag | gaa | tta | aga | gaa | gca | aca | tct | ccg | aaa | gcc | 2431 |  |
| Ile | Pro | Val | Ala | Ile | Lys | Glu | Leu | Arg | Glu | Ala | Thr | Ser | Pro | Lys | Ala |      |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | 740  |  |
| aac | aag | gaa | atc | ctc | gat | gaa | gcc | tac | gtg | atg | gcc | agc | gtg | gac | aac | 2479 |  |
| Asn | Lys | Glu | Ile | Leu | Asp | Glu | Ala | Tyr | Val | Met | Ala | Ser | Val | Asp | Asn |      |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | 760  |  |
| ccc | cac | gtg | tgc | cgc | ctg | ctg | ggc | atc | tgc | ctc | acc | tcc | acc | gtg | cag | 2527 |  |
| Pro | His | Val | Cys | Arg | Leu | Leu | Gly | Ile | Cys | Leu | Thr | Ser | Thr | Val | Gln |      |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | 775  |  |
| ctc | atc | acg | cag | ctc | atg | ccc | ttc | ggc | tgc | ctc | ctg | gac | tat | gtc | cgg | 2575 |  |
| Leu | Ile | Thr | Gln | Leu | Met | Pro | Phe | Gly | Cys | Leu | Leu | Asp | Tyr | Val | Arg |      |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | 790  |  |
| gaa | cac | aaa | gac | aat | att | ggc | tcc | cag | tac | ctg | ctc | aac | tgg | tgt | gtg | 2623 |  |
| Glu | His | Lys | Asp | Asn | Ile | Gly | Ser | Gln | Tyr | Leu | Leu | Asn | Trp | Cys | Val |      |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | 805  |  |
| cag | atc | gca | aag | ggc | atg | aac | tac | ttg | gag | gac | cgt | cgc | ttg | gtg | cac | 2671 |  |
| Gln | Ile | Ala | Lys | Gly | Met | Asn | Tyr | Leu | Glu | Asp | Arg | Arg | Leu | Val | His |      |  |

| 820   | 825  | 830  | 835  |      |
|---|------|------|------|------|
| cgc gac ctg gca gcc agg aac gta ctg gtg aaa aca ccg cag cat gtc |      |      |      | 2719 |
| Arg Asp Leu Ala Ala Arg Asn Val Leu Val Lys Thr Pro Gln His Val |      |      |      |      |
|   | 840  | 845  | 850  |      |
| aag atc aca gat ttt ggg ctg gcc aaa ctg ctg ggt gcg gaa gag aaa |      |      |      | 2767 |
| Lys Ile Thr Asp Phe Gly Leu Ala Lys Leu Leu Gly Ala Glu Glu Lys |      |      |      |      |
|   | 855  | 860  | 865  |      |
| gaa tac cat gca gaa gga ggc aaa gtg cct atc aag tgg atg gca ttg |      |      |      | 2815 |
| Glu Tyr His Ala Glu Gly Gly Lys Val Pro Ile Lys Trp Met Ala Leu |      |      |      |      |
|   | 870  | 875  | 880  |      |
| gaa tca att tta cac aga atc tat acc cac cag agt gat gtc tgg agc |      |      |      | 2863 |
| Glu Ser Ile Leu His Arg Ile Tyr Thr His Gln Ser Asp Val Trp Ser |      |      |      |      |
|   | 885  | 890  | 895  |      |
| tac ggg gtg acc gtt tgg gag ttg atg acc ttt gga tcc aag cca tat |      |      |      | 2911 |
| Tyr Gly Val Thr Val Trp Glu Leu Met Thr Phe Gly Ser Lys Pro Tyr |      |      |      |      |
| 900   | 905  | 910  | 915  |      |
| gac gga atc cct gcc agc gag atc tcc tcc atc ctg gag aaa gga gaa |      |      |      | 2959 |
| Asp Gly Ile Pro Ala Ser Glu Ile Ser Ser Ile Leu Glu Lys Gly Glu |      |      |      |      |
|   | 920  | 925  | 930  |      |
| cgc ctc cct cag cca ccc ata tgt acc atc gat gtc tac atg atc atg |      |      |      | 3007 |
| Arg Leu Pro Gln Pro Pro Ile Cys Thr Ile Asp Val Tyr Met Ile Met |      |      |      |      |
|   | 935  | 940  | 945  |      |
| gtc aag tgc tgg atg ata gac gca gat agt cgc cca aag ttc cgt gag |      |      |      | 3055 |
| Val Lys Cys Trp Met Ile Asp Ala Asp Ser Arg Pro Lys Phe Arg Glu |      |      |      |      |
|   | 950  | 955  | 960  |      |
| ttg atc atc gaa ttc tcc aaa atg gcc cga gac ccc cag cgc tac ctt |      |      |      | 3103 |
| Leu Ile Ile Glu Phe Ser Lys Met Ala Arg Asp Pro Gln Arg Tyr Leu |      |      |      |      |
|   | 965  | 970  | 975  |      |
| gtc att cag ggg gat gaa aga atg cat ttg cca agt cct aca gac tcc |      |      |      | 3151 |
| Val Ile Gln Gly Asp Glu Arg Met His Leu Pro Ser Pro Thr Asp Ser |      |      |      |      |
| 980   | 985  | 990  | 995  |      |
| aac ttc tac cgt gcc ctg atg gat gaa gaa gac atg gac gac gtg gtg |      |      |      | 3199 |
| Asn Phe Tyr Arg Ala Leu Met Asp Glu Glu Asp Met Asp Asp Val Val |      |      |      |      |
|   | 1000 | 1005 | 1010 |      |
| gat gcc gac gag tac ctc atc cca cag cag ggc ttc ttc agc agc ccc |      |      |      | 3247 |
| Asp Ala Asp Glu Tyr Leu Ile Pro Gln Gln Gly Phe Phe Ser Ser Pro |      |      |      |      |
|   | 1015 | 1020 | 1025 |      |
| tcc acg tca cgg act ccc ctc ctg agc tct ctg agt gca acc agc aac |      |      |      | 3295 |
| Ser Thr Ser Arg Thr Pro Leu Leu Ser Ser Leu Ser Ala Thr Ser Asn |      |      |      |      |
|   | 1030 | 1035 | 1040 |      |
| aat tcc acc gtg gct tgc att gat aga aat ggg ctg caa agc tgt ccc |      |      |      | 3343 |
| Asn Ser Thr Val Ala Cys Ile Asp Arg Asn Gly Leu Gln Ser Cys Pro |      |      |      |      |
|   | 1045 | 1050 | 1055 |      |

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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Gly | Thr | Ser | Asn | Lys | Leu | Thr | Gln | Leu | Gly | Thr | Phe | Glu | Asp | His | Phe |  |  |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |  |  |
| Leu | Ser | Leu | Gln | Arg | Met | Phe | Asn | Asn | Cys | Glu | Val | Val | Leu | Gly | Asn |  |  |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |  |  |
| Leu | Glu | Ile | Thr | Tyr | Val | Gln | Arg | Asn | Tyr | Asp | Leu | Ser | Phe | Leu | Lys |  |  |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |  |  |
| Thr | Ile | Gln | Glu | Val | Ala | Gly | Tyr | Val | Leu | Ile | Ala | Leu | Asn | Thr | Val |  |  |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |  |  |
| Glu | Arg | Ile | Pro | Leu | Glu | Asn | Leu | Gln | Ile | Ile | Arg | Gly | Asn | Met | Tyr |  |  |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |  |  |
| Tyr | Glu | Asn | Ser | Tyr | Ala | Leu | Ala | Val | Leu | Ser | Asn | Tyr | Asp | Ala | Asn |  |  |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     |     | 125 |     |     |  |  |
| Lys | Thr | Gly | Leu | Lys | Glu | Leu | Pro | Met | Arg | Asn | Leu | Gln | Glu | Ile | Leu |  |  |
|     | 130 |     |     |     |     | 135 |     |     |     |     |     | 140 |     |     |     |  |  |
| His | Gly | Ala | Val | Arg | Phe | Ser | Asn | Asn | Pro | Ala | Leu | Cys | Asn | Val | Glu |  |  |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |  |  |
| Ser | Ile | Gln | Trp | Arg | Asp | Ile | Val | Ser | Ser | Asp | Phe | Leu | Ser | Asn | Met |  |  |
|     |     |     |     | 165 |     |     |     | 170 |     |     |     |     |     | 175 |     |  |  |
| Ser | Met | Asp | Phe | Gln | Asn | His | Leu | Gly | Ser | Cys | Gln | Lys | Cys | Asp | Pro |  |  |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |  |  |
| Ser | Cys | Pro | Asn | Gly | Ser | Cys | Trp | Gly | Ala | Gly | Glu | Glu | Asn | Cys | Gln |  |  |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |  |  |
| Lys | Leu | Thr | Lys | Ile | Ile | Cys | Ala | Gln | Gln | Cys | Ser | Gly | Arg | Cys | Arg |  |  |
|     | 210 |     |     |     |     | 215 |     |     |     |     |     | 220 |     |     |     |  |  |
| Gly | Lys | Ser | Pro | Ser | Asp | Cys | Cys | His | Asn | Gln | Cys | Ala | Ala | Gly | Cys |  |  |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |  |
| Thr | Gly | Pro | Arg | Glu | Ser | Asp | Cys | Leu | Val | Cys | Arg | Lys | Phe | Arg | Asp |  |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |  |  |
| Glu | Ala | Thr | Cys | Lys | Asp | Thr | Cys | Pro | Pro | Leu | Met | Leu | Tyr | Asn | Pro |  |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |  |  |
| Thr | Thr | Tyr | Gln | Met | Asp | Val | Asn | Pro | Glu | Gly | Lys | Tyr | Ser | Phe | Gly |  |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     |     | 285 |     |     |  |  |
| Ala | Thr | Cys | Val | Lys | Lys | Cys | Pro | Arg | Asn | Tyr | Val | Val | Thr | Asp | His |  |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |  |  |
| Gly | Ser | Cys | Val | Arg | Ala | Cys | Gly | Ala | Asp | Ser | Tyr | Glu | Met | Glu | Glu |  |  |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |  |  |
| Asp | Gly | Val | Arg | Lys | Cys | Lys | Lys | Cys | Glu | Gly | Pro | Cys | Arg | Lys | Val |  |  |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |  |  |
| Cys | Asn | Gly | Ile | Gly | Ile | Gly | Glu | Phe | Lys | Asp | Ser | Leu | Ser | Ile | Asn |  |  |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |  |  |
| Ala | Thr | Asn | Ile | Lys | His | Phe | Lys | Asn | Cys | Thr | Ser | Ile | Ser | Gly | Asp |  |  |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     |     | 365 |     |     |  |  |
| Leu | His | Ile | Leu | Pro | Val | Ala | Phe | Arg | Gly | Asp | Ser | Phe | Thr | His | Thr |  |  |
|     | 370 |     |     |     |     | 375 |     |     |     |     |     | 380 |     |     |     |  |  |
| Pro | Pro | Leu | Asp | Pro | Gln | Glu | Leu | Asp | Ile | Leu | Lys | Thr | Val | Lys | Glu |  |  |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |  |  |
| Ile | Thr | Gly | Phe | Leu | Leu | Ile | Gln | Ala | Trp | Pro | Glu | Asn | Arg | Thr | Asp |  |  |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |  |  |
| Leu | His | Ala | Phe | Glu | Asn | Leu | Glu | Ile | Ile | Arg | Gly | Arg | Thr | Lys | Gln |  |  |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |  |  |
| His | Gly | Gln | Phe | Ser | Leu | Ala | Val | Val | Ser | Leu | Asn | Ile | Thr | Ser | Leu |  |  |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |  |  |
| Gly | Leu | Arg | Ser | Leu | Lys | Glu | Ile | Ser | Asp | Gly | Asp | Val | Ile | Ile | Ser |  |  |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |  |  |
| Gly | Asn | Lys | Asn | Leu | Cys | Tyr | Ala | Asn | Thr | Ile | Asn | Trp | Lys | Lys | Leu |  |  |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |  |  |
| Phe | Gly | Thr | Ser | Gly | Gln | Lys | Thr | Lys | Ile | Ile | Ser | Asn | Arg | Gly | Glu |  |  |

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Met Ile Met Val Lys Cys Trp Met Ile Asp Ala Asp Ser Arg Pro Lys  
 945 950 955 960  
 Phe Arg Glu Leu Ile Ile Glu Phe Ser Lys Met Ala Arg Asp Pro Gln  
 965 970 975  
 Arg Tyr Leu Val Ile Gln Gly Asp Glu Arg Met His Leu Pro Ser Pro  
 980 985 990  
 Thr Asp Ser Asn Phe Tyr Arg Ala Leu Met Asp Glu Glu Asp Met Asp  
 995 1000 1005  
 Asp Val Val Asp Ala Asp Glu Tyr Leu Ile Pro Gln Gln Gly Phe Phe  
 1010 1015 1020  
 Ser Ser Pro Ser Thr Ser Arg Thr Pro Leu Leu Ser Ser Leu Ser Ala  
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 Thr Ser Asn Asn Ser Thr Val Ala Cys Ile Asp Arg Asn Gly Leu Gln  
 1045 1050 1055  
 Ser Cys Pro Ile Lys Glu Asp Ser Phe Leu Gln Arg Tyr Ser Ser Asp  
 1060 1065 1070  
 Pro Thr Gly Ala Leu Thr Glu Asp Ser Ile Asp Asp Thr Phe Leu Pro  
 1075 1080 1085  
 Val Pro Glu Tyr Ile Asn Gln Ser Val Pro Lys Arg Pro Ala Gly Ser  
 1090 1095 1100  
 Val Gln Asn Pro Val Tyr His Asn Gln Pro Leu Asn Pro Ala Pro Ser  
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 Arg Asp Pro His Tyr Gln Asp Pro His Ser Thr Ala Val Gly Asn Pro  
 1125 1130 1135  
 Glu Tyr Leu Asn Thr Val Gln Pro Thr Cys Val Asn Ser Thr Phe Asp  
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 Ser Pro Ala His Trp Ala Gln Lys Gly Ser His Gln Ile Ser Leu Asp  
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 Asn Pro Asp Tyr Gln Gln Asp Phe Phe Pro Lys Glu Ala Lys Pro Asn  
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 tccgggtctc gtcgttgccg gcgcagtcac tgggcacaac cgtgggactc cgtctgtctc 180

|  |     |
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| ggattaatcc cggagagcca gagccaacct ctcccgggtca gag atg cga ccc tca | 235 |
| Met Arg Pro Ser  |     |
| 1  |     |
| ggg acc gcg aga acc aca ctg ctg gtg ctg ctg acc gcg ctc tgc gcc  | 283 |
| Gly Thr Ala Arg Thr Thr Leu Leu Val Leu Leu Thr Ala Leu Cys Ala  |     |
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| gca ggt ggg gcg ttg gag gaa aag aaa gtc tgc caa ggc aca agt aac  | 331 |
| Ala Gly Gly Ala Leu Glu Glu Lys Lys Val Cys Gln Gly Thr Ser Asn  |     |
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| agg ctc acc caa ctg ggc act ttt gaa gac cac ttt ctg agc ctg cag  | 379 |
| Arg Leu Thr Gln Leu Gly Thr Phe Glu Asp His Phe Leu Ser Leu Gln  |     |
| 40 45 50   |     |
| agg atg tac aac aac tgt gaa gtg gtc ctt ggg aac ttg gaa att acc  | 427 |
| Arg Met Tyr Asn Asn Cys Glu Val Val Leu Gly Asn Leu Glu Ile Thr  |     |
| 55 60 65   |     |
| tat gtg caa agg aat tac gac ctt tcc ttc tta aag acc atc cag gag  | 475 |
| Tyr Val Gln Arg Asn Tyr Asp Leu Ser Phe Leu Lys Thr Ile Gln Glu  |     |
| 70 75 80   |     |
| gtg gcc ggc tat gtc ctc att gcc ctc aac acc gtg gag aga atc cct  | 523 |
| Val Ala Gly Tyr Val Leu Ile Ala Leu Asn Thr Val Glu Arg Ile Pro  |     |
| 85 90 95 100   |     |
| ttg gag aac ctg cag atc atc agg gga aat gct ctt tat gaa aac acc  | 571 |
| Leu Glu Asn Leu Gln Ile Ile Arg Gly Asn Ala Leu Tyr Glu Asn Thr  |     |
| 105 110 115  |     |
| tat gcc tta gcc atc ctg tcc aac tat ggg aca aac aga act ggg ctt  | 619 |
| Tyr Ala Leu Ala Ile Leu Ser Asn Tyr Gly Thr Asn Arg Thr Gly Leu  |     |
| 120 125 130  |     |
| agg gaa ctg ccc atg cgg aac tta cag gaa atc ctg att ggt gct gtg  | 667 |
| Arg Glu Leu Pro Met Arg Asn Leu Gln Glu Ile Leu Ile Gly Ala Val  |     |
| 135 140 145  |     |
| cga ttc agc aac aac ccc atc ctc tgc aat atg gat act atc cag tgg  | 715 |
| Arg Phe Ser Asn Asn Pro Ile Leu Cys Asn Met Asp Thr Ile Gln Trp  |     |
| 150 155 160  |     |
| agg gac atc gtc caa aac gtc ttt atg agc aac atg tca atg gac tta  | 763 |
| Arg Asp Ile Val Gln Asn Val Phe Met Ser Asn Met Ser Met Asp Leu  |     |
| 165 170 175 180  |     |
| cag agc cat ccg agc agt tgc ccc aaa tgt gat cca agc tgt ccc aat  | 811 |
| Gln Ser His Pro Ser Ser Cys Pro Lys Cys Asp Pro Ser Cys Pro Asn  |     |
| 185 190 195  |     |
| gga agc tgc tgg gga gga gga gag gag aac tgc cag aaa ttg acc aaa  | 859 |
| Gly Ser Cys Trp Gly Gly Gly Glu Glu Asn Cys Gln Lys Leu Thr Lys  |     |
| 200 205 210  |     |
| atc atc tgt gcc cag caa tgt tcc cat cgc tgt cgt ggc agg tcc ccc  | 907 |



|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--|
| Ile | Ile | Cys | Ala | Gln | Gln | Cys | Ser | His | Arg | Cys | Arg | Gly | Arg | Ser | Pro |      |  |
|     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |     |     |     |      |  |
| agt | gac | tgc | tgc | cac | aac | caa | tgt | gct | gcg | ggg | tgt | aca | ggg | ccc | cga | 955  |  |
| Ser | Asp | Cys | Cys | His | Asn | Gln | Cys | Ala | Ala | Gly | Cys | Thr | Gly | Pro | Arg |      |  |
|     |     | 230 |     |     |     | 235 |     |     |     |     | 240 |     |     |     |     |      |  |
| gag | agt | gac | tgt | ctg | gtc | tgc | caa | aag | ttc | caa | gat | gag | gcc | aca | tgc | 1003 |  |
| Glu | Ser | Asp | Cys | Leu | Val | Cys | Gln | Lys | Phe | Gln | Asp | Glu | Ala | Thr | Cys |      |  |
|     |     | 245 |     |     | 250 |     |     |     |     | 255 |     |     |     |     | 260 |      |  |
| aaa | gac | acc | tgc | cca | cca | ctc | atg | ctg | tac | aac | ccc | acc | acc | tat | cag | 1051 |  |
| Lys | Asp | Thr | Cys | Pro | Pro | Leu | Met | Leu | Tyr | Asn | Pro | Thr | Thr | Tyr | Gln |      |  |
|     |     |     |     | 265 |     |     |     |     | 270 |     |     |     |     | 275 |     |      |  |
| atg | gat | gtc | aac | cct | gaa | ggg | aag | tac | agc | ttt | ggt | gcc | acc | tgt | gtg | 1099 |  |
| Met | Asp | Val | Asn | Pro | Glu | Gly | Lys | Tyr | Ser | Phe | Gly | Ala | Thr | Cys | Val |      |  |
|     |     |     | 280 |     |     |     |     | 285 |     |     |     |     | 290 |     |     |      |  |
| aag | aag | tgc | ccc | cga | aac | tac | gtg | gtg | aca | gat | cat | ggc | tca | tgt | gtc | 1147 |  |
| Lys | Lys | Cys | Pro | Arg | Asn | Tyr | Val | Val | Thr | Asp | His | Gly | Ser | Cys | Val |      |  |
|     |     | 295 |     |     |     | 300 |     |     |     |     |     | 305 |     |     |     |      |  |
| cga | gcc | tgt | ggg | cct | gac | tac | tac | gaa | gtg | gaa | gaa | gat | ggc | atc | cgc | 1195 |  |
| Arg | Ala | Cys | Gly | Pro | Asp | Tyr | Tyr | Glu | Val | Glu | Glu | Asp | Gly | Ile | Arg |      |  |
|     |     | 310 |     |     |     | 315 |     |     |     |     | 320 |     |     |     |     |      |  |
| aag | tgt | aaa | aaa | tgt | gat | ggg | ccc | tgt | cgc | aaa | gtt | tgt | aat | ggc | ata | 1243 |  |
| Lys | Cys | Lys | Lys | Cys | Asp | Gly | Pro | Cys | Arg | Lys | Val | Cys | Asn | Gly | Ile |      |  |
|     |     | 325 |     |     | 330 |     |     |     |     | 335 |     |     |     |     | 340 |      |  |
| ggc | att | ggt | gaa | ttt | aaa | gac | aca | ctc | tcc | ata | aat | gct | aca | aac | atc | 1291 |  |
| Gly | Ile | Gly | Glu | Phe | Lys | Asp | Thr | Leu | Ser | Ile | Asn | Ala | Thr | Asn | Ile |      |  |
|     |     |     |     | 345 |     |     |     |     | 350 |     |     |     |     | 355 |     |      |  |
| aaa | cac | ttc | aaa | tac | tgc | act | gcc | atc | agc | ggg | gac | ctt | cac | atc | ctg | 1339 |  |
| Lys | His | Phe | Lys | Tyr | Cys | Thr | Ala | Ile | Ser | Gly | Asp | Leu | His | Ile | Leu |      |  |
|     |     |     | 360 |     |     |     |     | 365 |     |     |     |     | 370 |     |     |      |  |
| cca | gtg | gcc | ttt | aag | ggg | gat | tct | ttc | acg | cgc | act | cct | cct | cta | gac | 1387 |  |
| Pro | Val | Ala | Phe | Lys | Gly | Asp | Ser | Phe | Thr | Arg | Thr | Pro | Pro | Leu | Asp |      |  |
|     |     | 375 |     |     |     | 380 |     |     |     |     |     | 385 |     |     |     |      |  |
| cca | cga | gaa | cta | gaa | att | cta | aaa | acc | gta | aag | gaa | ata | aca | ggc | ttt | 1435 |  |
| Pro | Arg | Glu | Leu | Glu | Ile | Leu | Lys | Thr | Val | Lys | Glu | Ile | Thr | Gly | Phe |      |  |
|     |     | 390 |     |     |     | 395 |     |     |     |     | 400 |     |     |     |     |      |  |
| ttg | ctg | att | cag | gct | tgg | cct | gat | aac | tgg | act | gac | ctc | cat | gct | ttc | 1483 |  |
| Leu | Leu | Ile | Gln | Ala | Trp | Pro | Asp | Asn | Trp | Thr | Asp | Leu | His | Ala | Phe |      |  |
|     |     | 405 |     |     | 410 |     |     |     |     | 415 |     |     |     |     | 420 |      |  |
| gag | aac | cta | gaa | ata | ata | cgt | ggc | aga | aca | aag | caa | cat | ggt | cag | ttt | 1531 |  |
| Glu | Asn | Leu | Glu | Ile | Ile | Arg | Gly | Arg | Thr | Lys | Gln | His | Gly | Gln | Phe |      |  |
|     |     |     | 425 |     |     |     |     | 430 |     |     |     |     |     | 435 |     |      |  |
| tct | ttg | gcg | gtc | gtt | ggc | ctg | aac | atc | aca | tca | ctg | ggg | ctg | cgt | tcc | 1579 |  |
| Ser | Leu | Ala | Val | Val | Gly | Leu | Asn | Ile | Thr | Ser | Leu | Gly | Leu | Arg | Ser |      |  |

| 440 |     |     |     |     |     |     |     |     |     | 445 |     |     |     |     |     |      |  |  |  | 450 |  |  |  |  |  |  |  |  |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--|--|--|-----|--|--|--|--|--|--|--|--|--|--|
| ctc | aag | gag | atc | agt | gat | ggg | gat | gtg | atc | att | tct | gga | aac | cga | aat | 1627 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Leu | Lys | Glu | Ile | Ser | Asp | Gly | Asp | Val | Ile | Ile | Ser | Gly | Asn | Arg | Asn |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 455 |     |     |     |     | 460 |     |     |     |     | 465 |     |     |     |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| ttg | tgc | tac | gca | aac | aca | ata | aac | tgg | aaa | aaa | ctc | ttc | ggg | aca | ccc | 1675 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Leu | Cys | Tyr | Ala | Asn | Thr | Ile | Asn | Trp | Lys | Lys | Leu | Phe | Gly | Thr | Pro |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 470 |     |     |     |     | 475 |     |     |     |     | 480 |     |     |     |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| aat | cag | aaa | acc | aaa | atc | atg | aac | aac | aga | gct | gag | aaa | gac | tgc | aag | 1723 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Asn | Gln | Lys | Thr | Lys | Ile | Met | Asn | Asn | Arg | Ala | Glu | Lys | Asp | Cys | Lys |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |     |     |     | 500 |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| gcc | gtg | aac | cac | gtc | tgc | aat | cct | tta | tgc | tcc | tcg | gaa | ggc | tgc | tgg | 1771 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Ala | Val | Asn | His | Val | Cys | Asn | Pro | Leu | Cys | Ser | Ser | Glu | Gly | Cys | Trp |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 505 |     |     |     |     | 510 |     |     |     |     | 515 |     |     |     |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| ggc | cct | gag | ccc | agg | gac | tgt | gtc | tcc | tgc | cag | aat | gtg | agc | aga | ggc | 1819 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Gly | Pro | Glu | Pro | Arg | Asp | Cys | Val | Ser | Cys | Gln | Asn | Val | Ser | Arg | Gly |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 520 |     |     |     |     | 525 |     |     |     |     | 530 |     |     |     |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| agg | gag | tgc | gtg | gag | aaa | tgc | aac | atc | ctg | gag | ggg | gaa | cca | agg | gag | 1867 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Arg | Glu | Cys | Val | Glu | Lys | Cys | Asn | Ile | Leu | Glu | Gly | Glu | Pro | Arg | Glu |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 535 |     |     |     |     | 540 |     |     |     |     | 545 |     |     |     |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| ttt | gtg | gaa | aat | tct | gaa | tgc | atc | cag | tgc | cat | cca | gaa | tgt | ctg | ccc | 1915 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Phe | Val | Glu | Asn | Ser | Glu | Cys | Ile | Gln | Cys | His | Pro | Glu | Cys | Leu | Pro |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 550 |     |     |     |     | 555 |     |     |     |     | 560 |     |     |     |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| cag | gcc | atg | aac | atc | acc | tgt | aca | ggc | agg | ggg | cca | gac | aac | tgc | atc | 1963 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Gln | Ala | Met | Asn | Ile | Thr | Cys | Thr | Gly | Arg | Gly | Pro | Asp | Asn | Cys | Ile |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 565 |     |     |     |     | 570 |     |     |     |     | 575 |     |     |     |     | 580 |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| cag | tgt | gcc | cac | tac | att | gat | ggc | cca | cac | tgt | gtc | aag | acc | tgc | cca | 2011 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Gln | Cys | Ala | His | Tyr | Ile | Asp | Gly | Pro | His | Cys | Val | Lys | Thr | Cys | Pro |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 585 |     |     |     |     | 590 |     |     |     |     | 595 |     |     |     |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| gct | ggc | atc | atg | gga | gag | aac | aac | act | ctg | gtc | tgg | aag | tat | gca | gat | 2059 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Ala | Gly | Ile | Met | Gly | Glu | Asn | Asn | Thr | Leu | Val | Trp | Lys | Tyr | Ala | Asp |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 600 |     |     |     |     | 605 |     |     |     |     | 610 |     |     |     |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| gcc | aat | aat | gtc | tgc | cac | cta | tgc | cac | gcc | aac | tgt | acc | tat | gga | tgt | 2107 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Ala | Asn | Asn | Val | Cys | His | Leu | Cys | His | Ala | Asn | Cys | Thr | Tyr | Gly | Cys |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 615 |     |     |     |     | 620 |     |     |     |     | 625 |     |     |     |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| gct | ggg | cca | ggg | ctt | caa | gga | tgt | gaa | gtg | tgg | cca | tct | ggg | cca | aag | 2155 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Ala | Gly | Pro | Gly | Leu | Gln | Gly | Cys | Glu | Val | Trp | Pro | Ser | Gly | Pro | Lys |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 630 |     |     |     |     | 635 |     |     |     |     | 640 |     |     |     |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| ata | cca | tct | att | gcc | act | ggg | att | gtg | ggt | ggc | ctc | ctc | ttc | ata | gtg | 2203 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Ile | Pro | Ser | Ile | Ala | Thr | Gly | Ile | Val | Gly | Gly | Leu | Leu | Phe | Ile | Val |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 645 |     |     |     |     | 650 |     |     |     |     | 655 |     |     |     |     | 660 |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| gtg | gtg | gcc | ctt | ggg | att | ggc | cta | ttc | atg | cga | aga | cgt | cac | att | gtt | 2251 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Val | Val | Ala | Leu | Gly | Ile | Gly | Leu | Phe | Met | Arg | Arg | Arg | His | Ile | Val |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 665 |     |     |     |     | 670 |     |     |     |     | 675 |     |     |     |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |

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| cga aag cgt aca cta cgc cgc ctg ctt caa gag aga gag ctc gtg gaa | 2299 |
| Arg Lys Arg Thr Leu Arg Arg Leu Leu Gln Glu Arg Glu Leu Val Glu |      |
| 680 685 690   |      |
| cct ctc aca ccc agc gga gaa gct cca aac caa gcc cac ttg agg ata | 2347 |
| Pro Leu Thr Pro Ser Gly Glu Ala Pro Asn Gln Ala His Leu Arg Ile |      |
| 695 700 705   |      |
| tta aag gaa aca gaa ttc aaa aag atc aaa gtt ctg ggt tcg gga gca | 2395 |
| Leu Lys Glu Thr Glu Phe Lys Lys Ile Lys Val Leu Gly Ser Gly Ala |      |
| 710 715 720   |      |
| ttt ggc aca gtg tat aag ggt ctc tgg atc cca gaa ggt gag aaa gta | 2443 |
| Phe Gly Thr Val Tyr Lys Gly Leu Trp Ile Pro Glu Gly Glu Lys Val |      |
| 725 730 735 740   |      |
| aaa atc ccg gtg gcc atc aag gag tta aga gaa gcc aca tct cca aaa | 2491 |
| Lys Ile Pro Val Ala Ile Lys Glu Leu Arg Glu Ala Thr Ser Pro Lys |      |
| 745 750 755   |      |
| gcc aac aaa gaa atc ctt gac gaa gcc tat gtg atg gct agt gtg gac | 2539 |
| Ala Asn Lys Glu Ile Leu Asp Glu Ala Tyr Val Met Ala Ser Val Asp |      |
| 760 765 770   |      |
| aac cct cat gta tgc cgc ctc ctg ggc atc tgt ctg acc tcc act gtc | 2587 |
| Asn Pro His Val Cys Arg Leu Leu Gly Ile Cys Leu Thr Ser Thr Val |      |
| 775 780 785   |      |
| cag ctc att aca cag ctc atg ccc tac ggt tgc ctc ctg gac tac gtc | 2635 |
| Gln Leu Ile Thr Gln Leu Met Pro Tyr Gly Cys Leu Leu Asp Tyr Val |      |
| 790 795 800   |      |
| cga gaa cac aag gac aac att ggc tcc cag tac ctc ctc aac tgg tgt | 2683 |
| Arg Glu His Lys Asp Asn Ile Gly Ser Gln Tyr Leu Leu Asn Trp Cys |      |
| 805 810 815 820   |      |
| gtg cag att gca aag ggc atg aac tac ctg gaa gat cgg cgt ttg gtg | 2731 |
| Val Gln Ile Ala Lys Gly Met Asn Tyr Leu Glu Asp Arg Arg Leu Val |      |
| 825 830 835   |      |
| cac cgt gac ttg gca gcc agg aat gta ctg gtg aag aca cca cag cat | 2779 |
| His Arg Asp Leu Ala Ala Arg Asn Val Leu Val Lys Thr Pro Gln His |      |
| 840 845 850   |      |
| gtc aag atc aca gat ttt ggg ctg gcc aaa ctg ctt ggt gct gaa gag | 2827 |
| Val Lys Ile Thr Asp Phe Gly Leu Ala Lys Leu Leu Gly Ala Glu Glu |      |
| 855 860 865   |      |
| aaa gaa tat cat gcc gag ggg ggc aaa gtg cct atc aag tgg atg gct | 2875 |
| Lys Glu Tyr His Ala Glu Gly Gly Lys Val Pro Ile Lys Trp Met Ala |      |
| 870 875 880   |      |
| ttg gaa tca att tta cac cga att tat aca cac caa agt gat gtc tgg | 2923 |
| Leu Glu Ser Ile Leu His Arg Ile Tyr Thr His Gln Ser Asp Val Trp |      |
| 885 890 895 900   |      |

|   |      |
|---|------|
| agc tat ggt gtc act gtg tgg gaa ctg atg acc ttt ggg tcc aag cct | 2971 |
| Ser Tyr Gly Val Thr Val Trp Glu Leu Met Thr Phe Gly Ser Lys Pro |      |
| 905 910 915   |      |
| tat gat gga atc cca gca agt gac atc tca tcc atc cta gag aaa gga | 3019 |
| Tyr Asp Gly Ile Pro Ala Ser Asp Ile Ser Ser Ile Leu Glu Lys Gly |      |
| 920 925 930   |      |
| gaa cgc ctt cca cag cca cct atc tgc acc atc gat gtc tac atg atc | 3067 |
| Glu Arg Leu Pro Gln Pro Pro Ile Cys Thr Ile Asp Val Tyr Met Ile |      |
| 935 940 945   |      |
| atg gtc aag tgc tgg atg ata gat gct gat agc cgc cca aag ttc cga | 3115 |
| Met Val Lys Cys Trp Met Ile Asp Ala Asp Ser Arg Pro Lys Phe Arg |      |
| 950 955 960   |      |
| gag ttg att ctt gaa ttc tcc aaa atg gcc cga gac cca cag cgc tac | 3163 |
| Glu Leu Ile Leu Glu Phe Ser Lys Met Ala Arg Asp Pro Gln Arg Tyr |      |
| 965 970 975 980   |      |
| ctt gtt atc cag ggg gat gaa aga atg cat ttg cca agc cct aca gac | 3211 |
| Leu Val Ile Gln Gly Asp Glu Arg Met His Leu Pro Ser Pro Thr Asp |      |
| 985 990 995   |      |
| tcc aac ttt tac cga gcc ctg atg gat gaa gag gac atg gag gat gta | 3259 |
| Ser Asn Phe Tyr Arg Ala Leu Met Asp Glu Glu Asp Met Glu Asp Val |      |
| 1000 1005 1010  |      |
| gtt gat gct gat gag tat ctt acc cca cag caa ggc ttc ttc aac agc | 3307 |
| Val Asp Ala Asp Glu Tyr Leu Thr Pro Gln Gln Gly Phe Phe Asn Ser |      |
| 1015 1020 1025  |      |
| ccg tcc acg tcg agg act ccc ctc ttg agt tct ctg agt gca act agc | 3355 |
| Pro Ser Thr Ser Arg Thr Pro Leu Leu Ser Ser Leu Ser Ala Thr Ser |      |
| 1030 1035 1040  |      |
| aac aat tcc act gtg gct tgc att aat aga aat ggg agc tgc cgt gtc | 3403 |
| Asn Asn Ser Thr Val Ala Cys Ile Asn Arg Asn Gly Ser Cys Arg Val |      |
| 1045 1050 1055 1060   |      |
| aaa gaa gac gcc ttc ttg cag cgg tac agc tcc gac ccc aca ggt gct | 3451 |
| Lys Glu Asp Ala Phe Leu Gln Arg Tyr Ser Ser Asp Pro Thr Gly Ala |      |
| 1065 1070 1075  |      |
| gta aca gag gac aac ata gat gac gca ttc ctc cct gta cct gaa tat | 3499 |
| Val Thr Glu Asp Asn Ile Asp Asp Ala Phe Leu Pro Val Pro Glu Tyr |      |
| 1080 1085 1090  |      |
| gta aac caa tct gtt ccc aag agg cca gca ggc tct gtg cag aac cct | 3547 |
| Val Asn Gln Ser Val Pro Lys Arg Pro Ala Gly Ser Val Gln Asn Pro |      |
| 1095 1100 1105  |      |
| gtc tat cac aat cag ccc ctg cat cca gct cct gga aga gac ctg cat | 3595 |
| Val Tyr His Asn Gln Pro Leu His Pro Ala Pro Gly Arg Asp Leu His |      |
| 1110 1115 1120  |      |
| tat caa aat ccc cac agc aat gca gtg ggc aac cct gag tat ctc aac | 3643 |

|             |             |            |            |            |            |      |          |      |            |            |     |      |      |      |      |
|-------------|-------------|------------|------------|------------|------------|------|----------|------|------------|------------|-----|------|------|------|------|
| Tyr         | Gln         | Asn        | Pro        | His        | Ser        | Asn  | Ala      | Val  | Gly        | Asn        | Pro | Glu  | Tyr  | Leu  | Asn  |
| 1125        |             |            |            |            |            | 1130 |          |      |            | 1135       |     |      |      |      | 1140 |
| act         | gcc         | cag        | cct        | acc        | tgt        | ctc  | agt      | agt  | ggg        | ttt        | aac | agc  | cct  | gca  | ctc  |
| Thr         | Ala         | Gln        | Pro        | Thr        | Cys        | Leu  | Ser      | Ser  | Gly        | Phe        | Asn | Ser  | Pro  | Ala  | Leu  |
|             |             |            |            | 1145       |            |      |          |      | 1150       |            |     |      |      | 1155 |      |
| tgg         | atc         | cag        | aaa        | ggc        | agt        | cac  | caa      | atg  | agc        | cta        | gac | aac  | cct  | gac  | tac  |
| Trp         | Ile         | Gln        | Lys        | Gly        | Ser        | His  | Gln      | Met  | Ser        | Leu        | Asp | Asn  | Pro  | Asp  | Tyr  |
|             |             |            | 1160       |            |            |      |          | 1165 |            |            |     |      | 1170 |      |      |
| cag         | cag         | gac        | ttc        | ttc        | ccc        | aag  | gaa      | acc  | aag        | cca        | aat | ggc  | ata  | ttt  | aag  |
| Gln         | Gln         | Asp        | Phe        | Phe        | Pro        | Lys  | Glu      | Thr  | Lys        | Pro        | Asn | Gly  | Ile  | Phe  | Lys  |
|             |             |            | 1175       |            |            |      | 1180     |      |            |            |     | 1185 |      |      |      |
| ggc         | ccc         | aca        | gct        | gaa        | aat        | gca  | gag      | tac  | cta        | cgg        | gtg | gca  | cct  | cca  | agc  |
| Gly         | Pro         | Thr        | Ala        | Glu        | Asn        | Ala  | Glu      | Tyr  | Leu        | Arg        | Val | Ala  | Pro  | Pro  | Ser  |
|             |             |            | 1190       |            |            | 1195 |          |      |            | 1200       |     |      |      |      |      |
| agc         | gag         | ttt        | att        | gga        | gca        | tga  | caagaagg | ggg  | catcatacca | gctataaaat |     |      |      |      |      |
| Ser         | Glu         | Phe        | Ile        | Gly        | Ala        |      |          |      |            |            |     |      |      |      |      |
| 1205        |             |            |            | 1210       |            |      |          |      |            |            |     |      |      |      |      |
| gtctggactt  | tctagaatcc  | caggaccaac | tatggcagca | cctccacttc | tggtagccat |      |          |      |            |            |     |      |      |      |      |
| 3946        |             |            |            |            |            |      |          |      |            |            |     |      |      |      |      |
| gccacgcgtg  | tgtcaaatgt  | cactcagact | ggctttaaag | cataactctg | atgggctttg |      |          |      |            |            |     |      |      |      |      |
| 4006        |             |            |            |            |            |      |          |      |            |            |     |      |      |      |      |
| tcactgagcc  | aagaagtggg  | cctctctoct | gatgcacttt | gggaagttga | aggtacatca |      |          |      |            |            |     |      |      |      |      |
| 4066        |             |            |            |            |            |      |          |      |            |            |     |      |      |      |      |
| attgatcttc  | gaactgtgaa  | gattccacaa | aaaaggtatc | catcgagaac | attgtccatt |      |          |      |            |            |     |      |      |      |      |
| 4126        |             |            |            |            |            |      |          |      |            |            |     |      |      |      |      |
| ggaacagaag  | tttgacctcat | ggtgaggtac | atatgggaaa | aaaacagaca | tatggagctt |      |          |      |            |            |     |      |      |      |      |
| 4186        |             |            |            |            |            |      |          |      |            |            |     |      |      |      |      |
| atgttttaggg | aactttggga  | ttcttgtctt | tattgatttg | attgatgcac | tcttgtagtc |      |          |      |            |            |     |      |      |      |      |
| 4246        |             |            |            |            |            |      |          |      |            |            |     |      |      |      |      |
| tggtacacag  | agttgcctgg  | agccaactga | ccagacagtt | ggttccacca | gctctgcadc |      |          |      |            |            |     |      |      |      |      |
| 4306        |             |            |            |            |            |      |          |      |            |            |     |      |      |      |      |
| aagacacttc  | cgtggcaaga  | caactaaatg | tataagaagt | ccatggatgc | cctgagcagg |      |          |      |            |            |     |      |      |      |      |
| 4366        |             |            |            |            |            |      |          |      |            |            |     |      |      |      |      |
| ccacacttgt  | acagcattaa  | accatggcag | atacaatagg | ataagccact | ttgttactta |      |          |      |            |            |     |      |      |      |      |
| 4426        |             |            |            |            |            |      |          |      |            |            |     |      |      |      |      |
| ctgggggctgg | gagaagagga  | atgacggggg | agaattttcc | ctcagacgta | ctttttatat |      |          |      |            |            |     |      |      |      |      |
| 4486        |             |            |            |            |            |      |          |      |            |            |     |      |      |      |      |
| aaatatgtcc  | ctggcaccta  | acacgcgcta | gtttaccagt | gttttctatt | agacttcctt |      |          |      |            |            |     |      |      |      |      |
| 4546        |             |            |            |            |            |      |          |      |            |            |     |      |      |      |      |
| ctatgttttc  | tgtttcattg  | ttttgagttg | taaatatgtg | ttcctgtctt | catttcatga |      |          |      |            |            |     |      |      |      |      |
| 4606        |             |            |            |            |            |      |          |      |            |            |     |      |      |      |      |
| agtaaacaaa  | caaacaaaaa  | accaggtatt | aagtattatc | aaagaacaac | catgattcca |      |          |      |            |            |     |      |      |      |      |
| 4666        |             |            |            |            |            |      |          |      |            |            |     |      |      |      |      |
| cattcgaacc  | cattcaaacc  | atcagtatgg | tgacaaaaag | cctttaacta | agaaggagta |      |          |      |            |            |     |      |      |      |      |
| 4726        |             |            |            |            |            |      |          |      |            |            |     |      |      |      |      |
| accatgcaaa  | aatccataga  | g          |            |            |            |      |          |      |            |            |     |      |      |      |      |

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 35 40 45  
 Leu Ser Leu Gln Arg Met Tyr Asn Asn Cys Glu Val Val Leu Gly Asn  
 50 55 60  
 Leu Glu Ile Thr Tyr Val Gln Arg Asn Tyr Asp Leu Ser Phe Leu Lys  
 65 70 75 80

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Thr | Ile | Gln | Glu | Val | Ala | Gly | Tyr | Val | Leu | Ile | Ala | Leu | Asn | Thr | Val |  |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |  |
| Glu | Arg | Ile | Pro | Leu | Glu | Asn | Leu | Gln | Ile | Ile | Arg | Gly | Asn | Ala | Leu |  |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |  |
| Tyr | Glu | Asn | Thr | Tyr | Ala | Leu | Ala | Ile | Leu | Ser | Asn | Tyr | Gly | Thr | Asn |  |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |  |
| Arg | Thr | Gly | Leu | Arg | Glu | Leu | Pro | Met | Arg | Asn | Leu | Gln | Glu | Ile | Leu |  |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |  |
| Ile | Gly | Ala | Val | Arg | Phe | Ser | Asn | Asn | Pro | Ile | Leu | Cys | Asn | Met | Asp |  |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |  |
| Thr | Ile | Gln | Trp | Arg | Asp | Ile | Val | Gln | Asn | Val | Phe | Met | Ser | Asn | Met |  |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     |     | 175 |  |
| Ser | Met | Asp | Leu | Gln | Ser | His | Pro | Ser | Ser | Cys | Pro | Lys | Cys | Asp | Pro |  |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |  |
| Ser | Cys | Pro | Asn | Gly | Ser | Cys | Trp | Gly | Gly | Gly | Glu | Glu | Asn | Cys | Gln |  |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |  |
| Lys | Leu | Thr | Lys | Ile | Ile | Cys | Ala | Gln | Gln | Cys | Ser | His | Arg | Cys | Arg |  |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |  |
| Gly | Arg | Ser | Pro | Ser | Asp | Cys | Cys | His | Asn | Gln | Cys | Ala | Ala | Gly | Cys |  |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Thr | Gly | Pro | Arg | Glu | Ser | Asp | Cys | Leu | Val | Cys | Gln | Lys | Phe | Gln | Asp |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     |     | 255 |  |
| Glu | Ala | Thr | Cys | Lys | Asp | Thr | Cys | Pro | Pro | Leu | Met | Leu | Tyr | Asn | Pro |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |  |
| Thr | Thr | Tyr | Gln | Met | Asp | Val | Asn | Pro | Glu | Gly | Lys | Tyr | Ser | Phe | Gly |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |  |
| Ala | Thr | Cys | Val | Lys | Lys | Cys | Pro | Arg | Asn | Tyr | Val | Val | Thr | Asp | His |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |  |
| Gly | Ser | Cys | Val | Arg | Ala | Cys | Gly | Pro | Asp | Tyr | Tyr | Glu | Val | Glu | Glu |  |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |  |
| Asp | Gly | Ile | Arg | Lys | Cys | Lys | Lys | Cys | Asp | Gly | Pro | Cys | Arg | Lys | Val |  |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     |     | 335 |  |
| Cys | Asn | Gly | Ile | Gly | Ile | Gly | Glu | Phe | Lys | Asp | Thr | Leu | Ser | Ile | Asn |  |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |  |
| Ala | Thr | Asn | Ile | Lys | His | Phe | Lys | Tyr | Cys | Thr | Ala | Ile | Ser | Gly | Asp |  |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |  |
| Leu | His | Ile | Leu | Pro | Val | Ala | Phe | Lys | Gly | Asp | Ser | Phe | Thr | Arg | Thr |  |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |  |
| Pro | Pro | Leu | Asp | Pro | Arg | Glu | Leu | Glu | Ile | Leu | Lys | Thr | Val | Lys | Glu |  |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |  |
| Ile | Thr | Gly | Phe | Leu | Leu | Ile | Gln | Ala | Trp | Pro | Asp | Asn | Trp | Thr | Asp |  |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     |     | 415 |  |
| Leu | His | Ala | Phe | Glu | Asn | Leu | Glu | Ile | Arg | Gly | Arg | Thr | Lys | Gln |     |  |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     | 430 |     |     |     |  |
| His | Gly | Gln | Phe | Ser | Leu | Ala | Val | Val | Gly | Leu | Asn | Ile | Thr | Ser | Leu |  |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |  |
| Gly | Leu | Arg | Ser | Leu | Lys | Glu | Ile | Ser | Asp | Gly | Asp | Val | Ile | Ile | Ser |  |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |  |
| Gly | Asn | Arg | Asn | Leu | Cys | Tyr | Ala | Asn | Thr | Ile | Asn | Trp | Lys | Lys | Leu |  |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |  |
| Phe | Gly | Thr | Pro | Asn | Gln | Lys | Thr | Lys | Ile | Met | Asn | Asn | Arg | Ala | Glu |  |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     |     | 495 |  |
| Lys | Asp | Cys | Lys | Ala | Val | Asn | His | Val | Cys | Asn | Pro | Leu | Cys | Ser | Ser |  |
|     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |     |     |  |
| Glu | Gly | Cys | Trp | Gly | Pro | Glu | Pro | Arg | Asp | Cys | Val | Ser | Cys | Gln | Asn |  |
|     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |  |
| Val | Ser | Arg | Gly | Arg | Glu | Cys | Val | Glu | Lys | Cys | Asn | Ile | Leu | Glu | Gly |  |

|   |   |     |     |     |
|---|---|-----|-----|-----|
| 530   |   | 535 |     | 540 |
| Glu Pro Arg Glu Phe Val   | Glu Asn Ser Glu Cys Ile Gln Cys His Pro |     |     |     |
| 545   | 550                                     | 555 | 560 |     |
| Glu Cys Leu Pro Gln Ala Met Asn Ile Thr Cys Thr Gly Arg Gly Pro |   |     |     |     |
|   | 565                                     | 570 | 575 |     |
| Asp Asn Cys Ile Gln Cys Ala His Tyr Ile Asp Gly Pro His Cys Val |   |     |     |     |
|   | 580                                     | 585 | 590 |     |
| Lys Thr Cys Pro Ala Gly Ile Met Gly Glu Asn Asn Thr Leu Val Trp |   |     |     |     |
|   | 595                                     | 600 | 605 |     |
| Lys Tyr Ala Asp Ala Asn Asn Val Cys His Leu Cys His Ala Asn Cys |   |     |     |     |
|   | 610                                     | 615 | 620 |     |
| Thr Tyr Gly Cys Ala Gly Pro Gly Leu Gln Gly Cys Glu Val Trp Pro |   |     |     |     |
|   | 625                                     | 630 | 635 | 640 |
| Ser Gly Pro Lys Ile Pro Ser Ile Ala Thr Gly Ile Val Gly Gly Leu |   |     |     |     |
|   | 645                                     | 650 | 655 |     |
| Leu Phe Ile Val Val Val Ala Leu Gly Ile Gly Leu Phe Met Arg Arg |   |     |     |     |
|   | 660                                     | 665 | 670 |     |
| Arg His Ile Val Arg Lys Arg Thr Leu Arg Arg Leu Leu Gln Glu Arg |   |     |     |     |
|   | 675                                     | 680 | 685 |     |
| Glu Leu Val Glu Pro Leu Thr Pro Ser Gly Glu Ala Pro Asn Gln Ala |   |     |     |     |
|   | 690                                     | 695 | 700 |     |
| His Leu Arg Ile Leu Lys Glu Thr Glu Phe Lys Lys Ile Lys Val Leu |   |     |     |     |
|   | 705                                     | 710 | 715 | 720 |
| Gly Ser Gly Ala Phe Gly Thr Val Tyr Lys Gly Leu Trp Ile Pro Glu |   |     |     |     |
|   | 725                                     | 730 | 735 |     |
| Gly Glu Lys Val Lys Ile Pro Val Ala Ile Lys Glu Leu Arg Glu Ala |   |     |     |     |
|   | 740                                     | 745 | 750 |     |
| Thr Ser Pro Lys Ala Asn Lys Glu Ile Leu Asp Glu Ala Tyr Val Met |   |     |     |     |
|   | 755                                     | 760 | 765 |     |
| Ala Ser Val Asp Asn Pro His Val Cys Arg Leu Leu Gly Ile Cys Leu |   |     |     |     |
|   | 770                                     | 775 | 780 |     |
| Thr Ser Thr Val Gln Leu Ile Thr Gln Leu Met Pro Tyr Gly Cys Leu |   |     |     |     |
|   | 785                                     | 790 | 795 | 800 |
| Leu Asp Tyr Val Arg Glu His Lys Asp Asn Ile Gly Ser Gln Tyr Leu |   |     |     |     |
|   | 805                                     | 810 | 815 |     |
| Leu Asn Trp Cys Val Gln Ile Ala Lys Gly Met Asn Tyr Leu Glu Asp |   |     |     |     |
|   | 820                                     | 825 | 830 |     |
| Arg Arg Leu Val His Arg Asp Leu Ala Ala Arg Asn Val Leu Val Lys |   |     |     |     |
|   | 835                                     | 840 | 845 |     |
| Thr Pro Gln His Val Lys Ile Thr Asp Phe Gly Leu Ala Lys Leu Leu |   |     |     |     |
|   | 850                                     | 855 | 860 |     |
| Gly Ala Glu Glu Lys Glu Tyr His Ala Glu Gly Lys Val Pro Ile     |   |     |     |     |
|   | 865                                     | 870 | 875 | 880 |
| Lys Trp Met Ala Leu Glu Ser Ile Leu His Arg Ile Tyr Thr His Gln |   |     |     |     |
|   | 885                                     | 890 | 895 |     |
| Ser Asp Val Trp Ser Tyr Gly Val Thr Val Trp Glu Leu Met Thr Phe |   |     |     |     |
|   | 900                                     | 905 | 910 |     |
| Gly Ser Lys Pro Tyr Asp Gly Ile Pro Ala Ser Asp Ile Ser Ser Ile |   |     |     |     |
|   | 915                                     | 920 | 925 |     |
| Leu Glu Lys Gly Glu Arg Leu Pro Gln Pro Pro Ile Cys Thr Ile Asp |   |     |     |     |
|   | 930                                     | 935 | 940 |     |
| Val Tyr Met Ile Met Val Lys Cys Trp Met Ile Asp Ala Asp Ser Arg |   |     |     |     |
|   | 945                                     | 950 | 955 | 960 |
| Pro Lys Phe Arg Glu Leu Ile Leu Glu Phe Ser Lys Met Ala Arg Asp |   |     |     |     |
|   | 965                                     | 970 | 975 |     |
| Pro Gln Arg Tyr Leu Val Ile Gln Gly Asp Glu Arg Met His Leu Pro |   |     |     |     |
|   | 980                                     | 985 | 990 |     |



Ser Pro Thr Asp Ser Asn Phe Tyr Arg Ala Leu Met Asp Glu Glu Asp  
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 Met Glu Asp Val Val Asp Ala Asp Glu Tyr Leu Thr Pro Gln Gln Gly  
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 Phe Phe Asn Ser Pro Ser Thr Ser Arg Thr Pro Leu Leu Ser Ser Leu  
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 Ser Cys Arg Val Lys Glu Asp Ala Phe Leu Gln Arg Tyr Ser Ser Asp  
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 1075 1080 1085  
 Val Pro Glu Tyr Val Asn Gln Ser Val Pro Lys Arg Pro Ala Gly Ser  
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 Arg Asp Leu His Tyr Gln Asn Pro His Ser Asn Ala Val Gly Asn Pro  
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 Glu Tyr Leu Asn Thr Ala Gln Pro Thr Cys Leu Ser Ser Gly Phe Asn  
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 Ser Pro Ala Leu Trp Ile Gln Lys Gly Ser His Gln Met Ser Leu Asp  
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 gtcacagtga agtcagccag agcagggctg ttaaactctg tgaaatttgt cataagggtg 180  
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 acaacaggag agtaaaagat gccccagggc tgaggcctcc gctcaggcag ccgcatctgg 360

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|------|
| gggtcaatcat actcaccttg ccggggccat gctccagcaa aatcaagctg ttttcttttg |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 420  |
| aaagttcaaaa ctcatcaaga tt atg ctg ctc act ctt atc att ctg ttg cca  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 472  |
| Met Leu Leu Thr Leu Ile Ile Leu Leu Pro                            |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 10   |
| gta gtt tca aaa ttt agt ttt gtt agt ctc tca gca ccg cag cac tgg    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 520  |
| Val Val Ser Lys Phe Ser Phe Val Ser Leu Ser Ala Pro Gln His Trp    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 25   |
| agc tgt cct gaa ggt act ctc gca gga aat ggg aat tct act tgt gtg    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 568  |
| Ser Cys Pro Glu Gly Thr Leu Ala Gly Asn Gly Asn Ser Thr Cys Val    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 40   |
| ggg cct gca ccc ttc tta att ttc tcc cat gga aat agt atc ttt agg    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 616  |
| Gly Pro Ala Pro Phe Leu Ile Phe Ser His Gly Asn Ser Ile Phe Arg    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 55   |
| att gac aca gaa gga acc aat tat gag caa ttg gtg gtg gat gct ggt    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 664  |
| Ile Asp Thr Glu Gly Thr Asn Tyr Glu Gln Leu Val Val Asp Ala Gly    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 70   |
| gtc tca gtg atc atg gat ttt cat tat aat gag aaa aga atc tat tgg    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 712  |
| Val Ser Val Ile Met Asp Phe His Tyr Asn Glu Lys Arg Ile Tyr Trp    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 90   |
| gtg gat tta gaa aga caa ctt ttg caa aga gtt ttt ctg aat ggg tca    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 760  |
| Val Asp Leu Glu Arg Gln Leu Leu Gln Arg Val Phe Leu Asn Gly Ser    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 105  |
| agg caa gag aga gta tgt aat ata gag aaa aat gtt tct gga atg gca    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 808  |
| Arg Gln Glu Arg Val Cys Asn Ile Glu Lys Asn Val Ser Gly Met Ala    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 120  |
| ata aat tgg ata aat gaa gaa gtt att tgg tca aat caa cag gaa gga    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 856  |
| Ile Asn Trp Ile Asn Glu Glu Val Ile Trp Ser Asn Gln Gln Glu Gly    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 135  |
| atc att aca gta aca gat atg aaa gga aat aat tcc cac att ctt tta    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 904  |
| Ile Ile Thr Val Thr Asp Met Lys Gly Asn Asn Ser His Ile Leu Leu    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 150  |
| agt gct tta aaa tat cct gca aat gta gca gtt gat cca gta gaa agg    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 952  |
| Ser Ala Leu Lys Tyr Pro Ala Asn Val Ala Val Asp Pro Val Glu Arg    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 170  |
| ttt ata ttt tgg tct tca gag gtg gct gga agc ctt tat aga gca gat    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1000 |
| Phe Ile Phe Trp Ser Ser Glu Val Ala Gly Ser Leu Tyr Arg Ala Asp    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 185  |
| ctc gat ggt gtg gga gtg aag gct ctg ttg gag aca tca gag aaa ata    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1048 |
| Leu Asp Gly Val Gly Val Lys Ala Leu Leu Glu Thr Ser Glu Lys Ile    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 200  |
| aca gct gtg tca ttg gat gtg ctt gat aag cgg ctg ttt tgg att cag    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1096 |
| Thr Ala Val Ser Leu Asp Val Leu Asp Lys Arg Leu Phe Trp Ile Gln    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 215  |

|   |      |
|---|------|
| tac aac aga gaa gga agc aat tct ctt att tgc tcc tgt gat tat gat | 1144 |
| Tyr Asn Arg Glu Gly Ser Asn Ser Leu Ile Cys Ser Cys Asp Tyr Asp |      |
| 220 225 230   |      |
| gga ggt tct gtc cac att agt aaa cat cca aca cag cat aat ttg ttt | 1192 |
| Gly Gly Ser Val His Ile Ser Lys His Pro Thr Gln His Asn Leu Phe |      |
| 235 240 245 250   |      |
| gca atg tcc ctt ttt ggt gac cgt atc ttc tat tca aca tgg aaa atg | 1240 |
| Ala Met Ser Leu Phe Gly Asp Arg Ile Phe Tyr Ser Thr Trp Lys Met |      |
| 255 260 265   |      |
| aag aca att tgg ata gcc aac aaa cac act gga aag gac atg gtt aga | 1288 |
| Lys Thr Ile Trp Ile Ala Asn Lys His Thr Gly Lys Asp Met Val Arg |      |
| 270 275 280   |      |
| att aac ctc cat tca tca ttt gta cca ctt ggt gaa ctg aaa gta gtg | 1336 |
| Ile Asn Leu His Ser Ser Phe Val Pro Leu Gly Glu Leu Lys Val Val |      |
| 285 290 295   |      |
| cat cca ctt gca caa ccc aag gca gaa gat gac act tgg gag cct gag | 1384 |
| His Pro Leu Ala Gln Pro Lys Ala Glu Asp Asp Thr Trp Glu Pro Glu |      |
| 300 305 310   |      |
| cag aaa ctt tgc aaa ttg agg aaa gga aac tgc agc agc act gtg tgt | 1432 |
| Gln Lys Leu Cys Lys Leu Arg Lys Gly Asn Cys Ser Ser Thr Val Cys |      |
| 315 320 325 330   |      |
| ggg caa gac ctc cag tca cac ttg tgc atg tgt gca gag gga tac gcc | 1480 |
| Gly Gln Asp Leu Gln Ser His Leu Cys Met Cys Ala Glu Gly Tyr Ala |      |
| 335 340 345   |      |
| cta agt cga gac cgg aag tac tgt gaa gat gtt aat gaa tgt gct ttt | 1528 |
| Leu Ser Arg Asp Arg Lys Tyr Cys Glu Asp Val Asn Glu Cys Ala Phe |      |
| 350 355 360   |      |
| tgg aat cat ggc tgt act ctt ggg tgt aaa aac acc cct gga tcc tat | 1576 |
| Trp Asn His Gly Cys Thr Leu Gly Cys Lys Asn Thr Pro Gly Ser Tyr |      |
| 365 370 375   |      |
| tac tgc acg tgc cct gta gga ttt gtt ctg ctt cct gat ggg aaa cga | 1624 |
| Tyr Cys Thr Cys Pro Val Gly Phe Val Leu Leu Pro Asp Gly Lys Arg |      |
| 380 385 390   |      |
| tgt cat caa ctt gtt tcc tgt cca cgc aat gtg tct gaa tgc agc cat | 1672 |
| Cys His Gln Leu Val Ser Cys Pro Arg Asn Val Ser Glu Cys Ser His |      |
| 395 400 405 410   |      |
| gac tgt gtt ctg aca tca gaa ggt ccc tta tgt ttc tgt cct gaa ggc | 1720 |
| Asp Cys Val Leu Thr Ser Glu Gly Pro Leu Cys Phe Cys Pro Glu Gly |      |
| 415 420 425   |      |
| tca gtg ctt gag aga gat ggg aaa aca tgt agc ggt tgt tcc tca ccc | 1768 |
| Ser Val Leu Glu Arg Asp Gly Lys Thr Cys Ser Gly Cys Ser Ser Pro |      |
| 430 435 440   |      |

|   |      |
|---|------|
| gat aat ggt gga tgt agc cag ctc tgc gtt cct ctt agc cca gta tcc | 1816 |
| Asp Asn Gly Gly Cys Ser Gln Leu Cys Val Pro Leu Ser Pro Val Ser |      |
| 445 450 455   |      |
| tgg gaa tgt gat tgc ttt cct ggg tat gac cta caa ctg gat gaa aaa | 1864 |
| Trp Glu Cys Asp Cys Phe Pro Gly Tyr Asp Leu Gln Leu Asp Glu Lys |      |
| 460 465 470   |      |
| agc tgt gca gct tca gga cca caa cca ttt ttg ctg ttt gcc aat tct | 1912 |
| Ser Cys Ala Ala Ser Gly Pro Gln Pro Phe Leu Leu Phe Ala Asn Ser |      |
| 475 480 485 490   |      |
| caa gat att cga cac atg cat ttt gat gga aca gac tat gga act ctg | 1960 |
| Gln Asp Ile Arg His Met His Phe Asp Gly Thr Asp Tyr Gly Thr Leu |      |
| 495 500 505   |      |
| ctc agc cag cag atg gga atg gtt tat gcc cta gat cat gac cct gtg | 2008 |
| Leu Ser Gln Gln Met Gly Met Val Tyr Ala Leu Asp His Asp Pro Val |      |
| 510 515 520   |      |
| gaa aat aag ata tac ttt gcc cat aca gcc ctg aag tgg ata gag aga | 2056 |
| Glu Asn Lys Ile Tyr Phe Ala His Thr Ala Leu Lys Trp Ile Glu Arg |      |
| 525 530 535   |      |
| gct aat atg gat ggt tcc cag cga gaa agg ctt att gag gaa gga gta | 2104 |
| Ala Asn Met Asp Gly Ser Gln Arg Glu Arg Leu Ile Glu Glu Gly Val |      |
| 540 545 550   |      |
| gat gtg cca gaa ggt ctt gct gtg gac tgg att ggc cgt aga ttc tat | 2152 |
| Asp Val Pro Glu Gly Leu Ala Val Asp Trp Ile Gly Arg Arg Phe Tyr |      |
| 555 560 565 570   |      |
| tgg aca gac aga ggg aaa tct ctg att gga agg agt gat tta aat ggg | 2200 |
| Trp Thr Asp Arg Gly Lys Ser Leu Ile Gly Arg Ser Asp Leu Asn Gly |      |
| 575 580 585   |      |
| aaa cgt tcc aaa ata atc act aag gag aac atc tct caa cca cga gga | 2248 |
| Lys Arg Ser Lys Ile Ile Thr Lys Glu Asn Ile Ser Gln Pro Arg Gly |      |
| 590 595 600   |      |
| att gct gtt cat cca atg gcc aag aga tta ttc tgg act gat aca ggg | 2296 |
| Ile Ala Val His Pro Met Ala Lys Arg Leu Phe Trp Thr Asp Thr Gly |      |
| 605 610 615   |      |
| att aat cca cga att gaa agt tct tcc ctc caa ggc ctt ggc cgt ctg | 2344 |
| Ile Asn Pro Arg Ile Glu Ser Ser Leu Gln Gly Leu Gly Arg Leu     |      |
| 620 625 630   |      |
| gtt ata gcc agc tct gat cta atc tgg ccc agt gga ata acg att gac | 2392 |
| Val Ile Ala Ser Ser Asp Leu Ile Trp Pro Ser Gly Ile Thr Ile Asp |      |
| 635 640 645 650   |      |
| ttc tta act gac aag ttg tac tgg tgc gat gcc aag cag tct gtg att | 2440 |
| Phe Leu Thr Asp Lys Leu Tyr Trp Cys Asp Ala Lys Gln Ser Val Ile |      |
| 655 660 665   |      |
| gaa atg gcc aat ctg gat ggt tca aaa cgc cga aga ctt acc cag aat | 2488 |

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| Glu Met Ala Asn Leu Asp Gly Ser Lys Arg Arg Arg Leu Thr Gln Asn |      |
| 670 675 680   |      |
| gat gta ggt cac cca ttt gct gta gca gtg ttt gag gat tat gtg tgg | 2536 |
| Asp Val Gly His Pro Phe Ala Val Ala Val Phe Glu Asp Tyr Val Trp |      |
| 685 690 695   |      |
| ttc tca gat tgg gct atg cca tca gta ata aga gta aac aag agg act | 2584 |
| Phe Ser Asp Trp Ala Met Pro Ser Val Ile Arg Val Asn Lys Arg Thr |      |
| 700 705 710   |      |
| ggc aaa gat aga gta cgt ctc caa ggc agc atg ctg aag ccc tca tca | 2632 |
| Gly Lys Asp Arg Val Arg Leu Gln Gly Ser Met Leu Lys Pro Ser Ser |      |
| 715 720 725 730   |      |
| ctg gtt gtg gtt cat cca ttg gca aaa cca gga gca gat ccc tgc tta | 2680 |
| Leu Val Val Val His Pro Leu Ala Lys Pro Gly Ala Asp Pro Cys Leu |      |
| 735 740 745   |      |
| tat caa aac gga ggc tgt gaa cat att tgc aaa aag agg ctt gga act | 2728 |
| Tyr Gln Asn Gly Gly Cys Glu His Ile Cys Lys Lys Arg Leu Gly Thr |      |
| 750 755 760   |      |
| gct tgg tgt tcg tgt cgt gaa ggt ttt atg aaa gcc tca gat ggg aaa | 2776 |
| Ala Trp Cys Ser Cys Arg Glu Gly Phe Met Lys Ala Ser Asp Gly Lys |      |
| 765 770 775   |      |
| acg tgt ctg gct ctg gat ggt cat cag ctg ttg gca ggt ggt gaa gtt | 2824 |
| Thr Cys Leu Ala Leu Asp Gly His Gln Leu Leu Ala Gly Gly Glu Val |      |
| 780 785 790   |      |
| gat cta aag aac caa gta aca cca ttg gac atc ttg tcc aag act aga | 2872 |
| Asp Leu Lys Asn Gln Val Thr Pro Leu Asp Ile Leu Ser Lys Thr Arg |      |
| 795 800 805 810   |      |
| gtg tca gaa gat aac att aca gaa tct caa cac atg cta gtg gct gaa | 2920 |
| Val Ser Glu Asp Asn Ile Thr Glu Ser Gln His Met Leu Val Ala Glu |      |
| 815 820 825   |      |
| atc atg gtg tca gat caa gat gac tgt gct cct gtg gga tgc agc atg | 2968 |
| Ile Met Val Ser Asp Gln Asp Asp Cys Ala Pro Val Gly Cys Ser Met |      |
| 830 835 840   |      |
| tat gct cgg tgt att tca gag gga gag gat gcc aca tgt cag tgt ttg | 3016 |
| Tyr Ala Arg Cys Ile Ser Glu Gly Glu Asp Ala Thr Cys Gln Cys Leu |      |
| 845 850 855   |      |
| aaa gga ttt gct ggg gat gga aaa cta tgt tct gat ata gat gaa tgt | 3064 |
| Lys Gly Phe Ala Gly Asp Gly Lys Leu Cys Ser Asp Ile Asp Glu Cys |      |
| 860 865 870   |      |
| gag atg ggt gtc cca gtg tgc ccc cct gcc tcc tcc aag tgc atc aac | 3112 |
| Glu Met Gly Val Pro Val Cys Pro Pro Ala Ser Ser Lys Cys Ile Asn |      |
| 875 880 885 890   |      |
| acc gaa ggt ggt tat gtc tgc cgg tgc tca gaa ggc tac caa gga gat | 3160 |
| Thr Glu Gly Gly Tyr Val Cys Arg Cys Ser Glu Gly Tyr Gln Gly Asp |      |

| 895   |      |  |  |  |  |  |  |  |  | 900 |  |  |  |  | 905 |  |  |  |  |  |
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| ggg att cac tgt ctt gat att gat gag tgc caa ctg ggg gtg cac agc | 3208 |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| Gly Ile His Cys Leu Asp Ile Asp Glu Cys Gln Leu Gly Val His Ser |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| 910 915 920   |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| tgt gga gag aat gcc agc tgc aca aat aca gag gga ggc tat acc tgc | 3256 |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| Cys Gly Glu Asn Ala Ser Cys Thr Asn Thr Glu Gly Gly Tyr Thr Cys |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| 925 930 935   |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| atg tgt gct gga cgc ctg tct gaa cca gga ctg att tgc cct gac tct | 3304 |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| Met Cys Ala Gly Arg Leu Ser Glu Pro Gly Leu Ile Cys Pro Asp Ser |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| 940 945 950   |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| act cca ccc cct cac ctc agg gaa gat gac cac cac tat tcc gta aga | 3352 |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| Thr Pro Pro Pro His Leu Arg Glu Asp Asp His His Tyr Ser Val Arg |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| 955 960 965 970   |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| aat agt gac tct gaa tgt ccc ctg tcc cac gat ggg tac tgc ctc cat | 3400 |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| Asn Ser Asp Ser Glu Cys Pro Leu Ser His Asp Gly Tyr Cys Leu His |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| 975 980 985   |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| gat ggt gtg tgc atg tat att gaa gca ttg gac aag tat gca tgc aac | 3448 |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| Asp Gly Val Cys Met Tyr Ile Glu Ala Leu Asp Lys Tyr Ala Cys Asn |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| 990 995 1000  |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| tgt gtt gtt ggc tac atc ggg gag cga tgt cag tac cga gac ctg aag | 3496 |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| Cys Val Val Gly Tyr Ile Gly Glu Arg Cys Gln Tyr Arg Asp Leu Lys |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| 1005 1010 1015  |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| tgg tgg gaa ctg cgc cac gct ggc cac ggg cag cag cag aag gtc atc | 3544 |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| Trp Trp Glu Leu Arg His Ala Gly His Gly Gln Gln Gln Lys Val Ile |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
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| Val Val Ala Val Cys Val Val Val Leu Val Met Leu Leu Leu Leu Ser |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| 1035 1040 1045 1050   |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
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| Leu Trp Gly Ala His Tyr Tyr Arg Thr Gln Lys Leu Leu Ser Lys Asn |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| 1055 1060 1065  |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| cca aag aat cct tat gag gag tcg agc aga gat gtg agg agt cgc agg | 3688 |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| Pro Lys Asn Pro Tyr Glu Glu Ser Ser Arg Asp Val Arg Ser Arg Arg |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| 1070 1075 1080  |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| cct gct gac act gag gat ggg atg tcc tct tgc cct caa cct tgg ttt | 3736 |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| Pro Ala Asp Thr Glu Asp Gly Met Ser Ser Cys Pro Gln Pro Trp Phe |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| 1085 1090 1095  |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
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| Val Val Ile Lys Glu His Gln Asp Leu Lys Asn Gly Gly Gln Pro Val |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| 1100 1105 1110  |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
| gct ggt gag gat ggc cag gca gca gat ggg tca atg caa cca act tca | 3832 |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |
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| 1115 1120 1125 1130   |      |  |  |  |  |  |  |  |  |     |  |  |  |  |     |  |  |  |  |  |

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| Met | Leu | Leu | Thr | Leu | Ile | Ile | Leu | Leu | Pro | Val | Val | Ser | Lys | Phe | Ser | 1   | 5   | 10  | 15  |
| Phe | Val | Ser | Leu | Ser | Ala | Pro | Gln | His | Trp | Ser | Cys | Pro | Glu | Gly | Thr | 20  | 25  | 30  |     |
| Leu | Ala | Gly | Asn | Gly | Asn | Ser | Thr | Cys | Val | Gly | Pro | Ala | Pro | Phe | Leu | 35  | 40  | 45  |     |
| Ile | Phe | Ser | His | Gly | Asn | Ser | Ile | Phe | Arg | Ile | Asp | Thr | Glu | Gly | Thr | 50  | 55  | 60  |     |
| Asn | Tyr | Glu | Gln | Leu | Val | Val | Asp | Ala | Gly | Val | Ser | Val | Ile | Met | Asp | 65  | 70  | 75  | 80  |
| Phe | His | Tyr | Asn | Glu | Lys | Arg | Ile | Tyr | Trp | Val | Asp | Leu | Glu | Arg | Gln | 85  | 90  | 95  |     |
| Leu | Leu | Gln | Arg | Val | Phe | Leu | Asn | Gly | Ser | Arg | Gln | Glu | Arg | Val | Cys | 100 | 105 | 110 |     |
| Asn | Ile | Glu | Lys | Asn | Val | Ser | Gly | Met | Ala | Ile | Asn | Trp | Ile | Asn | Glu | 115 | 120 | 125 |     |
| Glu | Val | Ile | Trp | Ser | Asn | Gln | Gln | Glu | Gly | Ile | Ile | Thr | Val | Thr | Asp | 130 | 135 | 140 |     |
| Met | Lys | Gly | Asn | Asn | Ser | His | Ile | Leu | Leu | Ser | Ala | Leu | Lys | Tyr | Pro | 145 | 150 | 155 | 160 |
| Ala | Asn | Val | Ala | Val | Asp | Pro | Val | Glu | Arg | Phe | Ile | Phe | Trp | Ser | Ser | 165 | 170 | 175 |     |
| Glu | Val | Ala | Gly | Ser | Leu | Tyr | Arg | Ala | Asp | Leu | Asp | Gly | Val | Gly | Val | 180 | 185 | 190 |     |
| Lys | Ala | Leu | Glu | Thr | Ser | Glu | Lys | Ile | Thr | Ala | Val | Ser | Leu | Asp |     | 195 | 200 | 205 |     |
| Val | Leu | Asp | Lys | Arg | Leu | Phe | Trp | Ile | Gln | Tyr | Asn | Arg | Glu | Gly | Ser | 210 | 215 | 220 |     |
| Asn | Ser | Leu | Ile | Cys | Ser | Cys | Asp | Tyr | Asp | Gly | Gly | Ser | Val | His | Ile | 225 | 230 | 235 | 240 |
| Ser | Lys | His | Pro | Thr | Gln | His | Asn | Leu | Phe | Ala | Met | Ser | Leu | Phe | Gly | 245 | 250 | 255 |     |
| Asp | Arg | Ile | Phe | Tyr | Ser | Thr | Trp | Lys | Met | Lys | Thr | Ile | Trp | Ile | Ala | 260 | 265 | 270 |     |
| Asn | Lys | His | Thr | Gly | Lys | Asp | Met | Val | Arg | Ile | Asn | Leu | His | Ser | Ser | 275 | 280 | 285 |     |
| Phe | Val | Pro | Leu | Gly | Glu | Leu | Lys | Val | Val | His | Pro | Leu | Ala | Gln | Pro | 290 | 295 | 300 |     |
| Lys | Ala | Glu | Asp | Asp | Thr | Trp | Glu | Pro | Glu | Gln | Lys | Leu | Cys | Lys | Leu | 305 | 310 | 315 | 320 |
| Arg | Lys | Gly | Asn | Cys | Ser | Ser | Thr | Val | Cys | Gly | Gln | Asp | Leu | Gln | Ser | 325 | 330 | 335 |     |
| His | Leu | Cys | Met | Cys | Ala | Glu | Gly | Tyr | Ala | Leu | Ser | Arg | Asp | Arg | Lys | 340 | 345 | 350 |     |
| Tyr | Cys | Glu | Asp | Val | Asn | Glu | Cys | Ala | Phe | Trp | Asn | His | Gly | Cys | Thr | 355 | 360 | 365 |     |
| Leu | Gly | Cys | Lys | Asn | Thr | Pro | Gly | Ser | Tyr | Tyr | Cys | Thr | Cys | Pro | Val | 370 | 375 | 380 |     |
| Gly | Phe | Val | Leu | Leu | Pro | Asp | Gly | Lys | Arg | Cys | His | Gln | Leu | Val | Ser | 385 | 390 | 395 | 400 |
| Cys | Pro | Arg | Asn | Val | Ser | Glu | Cys | Ser | His | Asp | Cys | Val | Leu | Thr | Ser | 405 | 410 | 415 |     |
| Glu | Gly | Pro | Leu | Cys | Phe | Cys | Pro | Glu | Gly | Ser | Val | Leu | Glu | Arg | Asp | 420 | 425 | 430 |     |



|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Gly | Lys | Thr | Cys | Ser | Gly | Cys | Ser | Ser | Pro | Asp | Asn | Gly | Gly | Cys | Ser |  |  |
|     |     | 435 |     |     |     |     | 440 |     |     |     | 445 |     |     |     |     |  |  |
| Gln | Leu | Cys | Val | Pro | Leu | Ser | Pro | Val | Ser | Trp | Glu | Cys | Asp | Cys | Phe |  |  |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |  |  |
| Pro | Gly | Tyr | Asp | Leu | Gln | Leu | Asp | Glu | Lys | Ser | Cys | Ala | Ala | Ser | Gly |  |  |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |  |  |
| Pro | Gln | Pro | Phe | Leu | Leu | Phe | Ala | Asn | Ser | Gln | Asp | Ile | Arg | His | Met |  |  |
|     |     |     | 485 |     |     |     |     | 490 |     |     |     |     |     | 495 |     |  |  |
| His | Phe | Asp | Gly | Thr | Asp | Tyr | Gly | Thr | Leu | Leu | Ser | Gln | Gln | Met | Gly |  |  |
|     |     | 500 |     |     |     |     | 505 |     |     |     |     |     | 510 |     |     |  |  |
| Met | Val | Tyr | Ala | Leu | Asp | His | Asp | Pro | Val | Glu | Asn | Lys | Ile | Tyr | Phe |  |  |
|     | 515 |     |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |  |  |
| Ala | His | Thr | Ala | Leu | Lys | Trp | Ile | Glu | Arg | Ala | Asn | Met | Asp | Gly | Ser |  |  |
|     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |  |  |
| Gln | Arg | Glu | Arg | Leu | Ile | Glu | Glu | Gly | Val | Asp | Val | Pro | Glu | Gly | Leu |  |  |
| 545 |     |     |     |     | 550 |     |     |     |     | 555 |     |     |     |     | 560 |  |  |
| Ala | Val | Asp | Trp | Ile | Gly | Arg | Arg | Phe | Tyr | Trp | Thr | Asp | Arg | Gly | Lys |  |  |
|     |     |     | 565 |     |     |     |     | 570 |     |     |     |     |     | 575 |     |  |  |
| Ser | Leu | Ile | Gly | Arg | Ser | Asp | Leu | Asn | Gly | Lys | Arg | Ser | Lys | Ile | Ile |  |  |
|     |     | 580 |     |     |     |     |     | 585 |     |     |     |     | 590 |     |     |  |  |
| Thr | Lys | Glu | Asn | Ile | Ser | Gln | Pro | Arg | Gly | Ile | Ala | Val | His | Pro | Met |  |  |
|     | 595 |     |     |     |     | 600 |     |     |     |     |     | 605 |     |     |     |  |  |
| Ala | Lys | Arg | Leu | Phe | Trp | Thr | Asp | Thr | Gly | Ile | Asn | Pro | Arg | Ile | Glu |  |  |
|     | 610 |     |     |     |     | 615 |     |     |     |     | 620 |     |     |     |     |  |  |
| Ser | Ser | Ser | Leu | Gln | Gly | Leu | Gly | Arg | Leu | Val | Ile | Ala | Ser | Ser | Asp |  |  |
| 625 |     |     |     |     | 630 |     |     |     |     | 635 |     |     |     |     | 640 |  |  |
| Leu | Ile | Trp | Pro | Ser | Gly | Ile | Thr | Ile | Asp | Phe | Leu | Thr | Asp | Lys | Leu |  |  |
|     |     |     | 645 |     |     |     |     |     | 650 |     |     |     |     | 655 |     |  |  |
| Tyr | Trp | Cys | Asp | Ala | Lys | Gln | Ser | Val | Ile | Glu | Met | Ala | Asn | Leu | Asp |  |  |
|     |     | 660 |     |     |     |     |     | 665 |     |     |     |     | 670 |     |     |  |  |
| Gly | Ser | Lys | Arg | Arg | Arg | Leu | Thr | Gln | Asn | Asp | Val | Gly | His | Pro | Phe |  |  |
|     | 675 |     |     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |  |  |
| Ala | Val | Ala | Val | Phe | Glu | Asp | Tyr | Val | Trp | Phe | Ser | Asp | Trp | Ala | Met |  |  |
|     | 690 |     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     |  |  |
| Pro | Ser | Val | Ile | Arg | Val | Asn | Lys | Arg | Thr | Gly | Lys | Asp | Arg | Val | Arg |  |  |
| 705 |     |     |     |     | 710 |     |     |     |     | 715 |     |     |     |     | 720 |  |  |
| Leu | Gln | Gly | Ser | Met | Leu | Lys | Pro | Ser | Ser | Leu | Val | Val | Val | His | Pro |  |  |
|     |     |     | 725 |     |     |     |     |     | 730 |     |     |     |     | 735 |     |  |  |
| Leu | Ala | Lys | Pro | Gly | Ala | Asp | Pro | Cys | Leu | Tyr | Gln | Asn | Gly | Gly | Cys |  |  |
|     |     | 740 |     |     |     |     |     | 745 |     |     |     |     | 750 |     |     |  |  |
| Glu | His | Ile | Cys | Lys | Lys | Arg | Leu | Gly | Thr | Ala | Trp | Cys | Ser | Cys | Arg |  |  |
|     | 755 |     |     |     |     |     | 760 |     |     |     |     | 765 |     |     |     |  |  |
| Glu | Gly | Phe | Met | Lys | Ala | Ser | Asp | Gly | Lys | Thr | Cys | Leu | Ala | Leu | Asp |  |  |
|     | 770 |     |     |     |     |     | 775 |     |     |     |     | 780 |     |     |     |  |  |
| Gly | His | Gln | Leu | Leu | Ala | Gly | Gly | Glu | Val | Asp | Leu | Lys | Asn | Gln | Val |  |  |
| 785 |     |     |     |     | 790 |     |     |     |     | 795 |     |     |     |     | 800 |  |  |
| Thr | Pro | Leu | Asp | Ile | Leu | Ser | Lys | Thr | Arg | Val | Ser | Glu | Asp | Asn | Ile |  |  |
|     |     |     | 805 |     |     |     |     |     | 810 |     |     |     |     | 815 |     |  |  |
| Thr | Glu | Ser | Gln | His | Met | Leu | Val | Ala | Glu | Ile | Met | Val | Ser | Asp | Gln |  |  |
|     |     | 820 |     |     |     |     |     | 825 |     |     |     |     | 830 |     |     |  |  |
| Asp | Asp | Cys | Ala | Pro | Val | Gly | Cys | Ser | Met | Tyr | Ala | Arg | Cys | Ile | Ser |  |  |
|     |     | 835 |     |     |     |     | 840 |     |     |     |     | 845 |     |     |     |  |  |
| Glu | Gly | Glu | Asp | Ala | Thr | Cys | Gln | Cys | Leu | Lys | Gly | Phe | Ala | Gly | Asp |  |  |
|     | 850 |     |     |     |     | 855 |     |     |     |     | 860 |     |     |     |     |  |  |
| Gly | Lys | Leu | Cys | Ser | Asp | Ile | Asp | Glu | Cys | Glu | Met | Gly | Val | Pro | Val |  |  |
| 865 |     |     |     |     | 870 |     |     |     |     | 875 |     |     |     |     | 880 |  |  |
| Cys | Pro | Pro | Ala | Ser | Ser | Lys | Cys | Ile | Asn | Thr | Glu | Gly | Gly | Tyr | Val |  |  |



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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--|--|--|-----|--|--|--|--|--|--|--|--|--|--|
| ttg | atg | ttt | tgg | tct | tca | gag | gtg | acc | ggc | agc | ctt | cac | aga | gca | cac | 932  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Leu | Met | Phe | Trp | Ser | Ser | Glu | Val | Thr | Gly | Ser | Leu | His | Arg | Ala | His |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
|     |     | 180 |     |     |     |     |     | 185 |     |     |     |     | 190 |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| ctc | aaa | ggg | gtt | gat | gta | aaa | aca | ctg | ctg | gag | aca | ggg | gga | ata | tcg | 980  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Leu | Lys | Gly | Val | Asp | Val | Lys | Thr | Leu | Leu | Glu | Thr | Gly | Gly | Ile | Ser |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
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| gtg | ctg | act | ctg | gat | gtc | ctg | gac | aaa | cgg | ctc | ttc | tgg | gtt | cag | gac | 1028 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Val | Leu | Thr | Leu | Asp | Val | Leu | Asp | Lys | Arg | Leu | Phe | Trp | Val | Gln | Asp |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| agt | ggc | gaa | gga | agc | cac | gct | tac | att | cat | tcc | tgt | gat | tat | gag | ggg | 1076 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Ser | Gly | Glu | Gly | Ser | His | Ala | Tyr | Ile | His | Ser | Cys | Asp | Tyr | Glu | Gly |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| ggc | tcc | gtc | cgt | ctt | atc | agg | cat | caa | gca | cgg | cac | agt | ttg | tct | tca | 1124 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Gly | Ser | Val | Arg | Leu | Ile | Arg | His | Gln | Ala | Arg | His | Ser | Leu | Ser | Ser |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| atg | gcc | ttt | ttt | ggg | gat | cgg | atc | ttc | tac | tca | gtg | ttg | aaa | agc | aag | 1172 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Met | Ala | Phe | Phe | Gly | Asp | Arg | Ile | Phe | Tyr | Ser | Val | Leu | Lys | Ser | Lys |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
|     | 260 |     |     |     |     |     | 265 |     |     |     |     | 270 |     |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| gcg | att | tgg | ata | gcc | aac | aaa | cac | acg | ggg | aag | gac | acg | gtc | agg | att | 1220 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Ala | Ile | Trp | Ile | Ala | Asn | Lys | His | Thr | Gly | Lys | Asp | Thr | Val | Arg | Ile |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
|     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| aac | ctc | cat | cca | tcc | ttt | gtg | aca | cct | gga | aaa | ctg | atg | gta | gta | cac | 1268 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Asn | Leu | His | Pro | Ser | Phe | Val | Thr | Pro | Gly | Lys | Leu | Met | Val | Val | His |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     | 305 |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| cct | cgt | gca | cag | ccc | agg | aca | gag | gac | gct | gct | aag | gat | cct | gac | ccc | 1316 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Pro | Arg | Ala | Gln | Pro | Arg | Thr | Glu | Asp | Ala | Ala | Lys | Asp | Pro | Asp | Pro |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
|     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| gaa | ctt | ctc | aaa | cag | agg | gga | aga | cca | tgc | cgc | ttc | ggg | ctc | tgt | gag | 1364 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Glu | Leu | Leu | Lys | Gln | Arg | Gly | Arg | Pro | Cys | Arg | Phe | Gly | Leu | Cys | Glu |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
|     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| cga | gac | ccc | aag | tcc | cac | tcg | agc | gca | tgc | gct | gag | ggc | tac | acg | tta | 1412 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Arg | Asp | Pro | Lys | Ser | His | Ser | Ser | Ala | Cys | Ala | Glu | Gly | Tyr | Thr | Leu |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
|     |     | 340 |     |     |     |     |     | 345 |     |     |     | 350 |     |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| agc | cga | gac | cgg | aag | tac | tgc | gaa | gat | gtc | aat | gaa | tgt | gcc | act | cag | 1460 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Ser | Arg | Asp | Arg | Lys | Tyr | Cys | Glu | Asp | Val | Asn | Glu | Cys | Ala | Thr | Gln |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
|     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| aat | cac | ggc | tgt | act | ctt | ggg | tgt | gaa | aac | acc | cct | gga | tcc | tat | cac | 1508 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Asn | His | Gly | Cys | Thr | Leu | Gly | Cys | Glu | Asn | Thr | Pro | Gly | Ser | Tyr | His |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     | 385 |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| tgc | aca | tgc | ccc | aca | gga | ttt | gtt | ctg | ctt | cct | gat | ggg | aaa | caa | tgt | 1556 |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
| Cys | Thr | Cys | Pro | Thr | Gly | Phe | Val | Leu | Leu | Pro | Asp | Gly | Lys | Gln | Cys |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |
|     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |     |      |  |  |  |     |  |  |  |  |  |  |  |  |  |  |

|   |      |
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| cac gaa ctt gtt tcc tgc cca ggc aac gta tca aag tgc agt cat ggc | 1604 |
| His Glu Leu Val Ser Cys Pro Gly Asn Val Ser Lys Cys Ser His Gly |      |
| 405 410 415   |      |
| tgt gtc ctg aca tca gat ggt ccc cgg tgc atc tgt cct gca ggt tca | 1652 |
| Cys Val Leu Thr Ser Asp Gly Pro Arg Cys Ile Cys Pro Ala Gly Ser |      |
| 420 425 430   |      |
| gtg ctt ggg aga gat ggg aag act tgc act ggt tgt tca tcg cct gac | 1700 |
| Val Leu Gly Arg Asp Gly Lys Thr Cys Thr Gly Cys Ser Ser Pro Asp |      |
| 435 440 445   |      |
| aat ggt gga tgc agc cag atc tgt ctt cct ctc agg cca gga tcc tgg | 1748 |
| Asn Gly Gly Cys Ser Gln Ile Cys Leu Pro Leu Arg Pro Gly Ser Trp |      |
| 450 455 460 465   |      |
| gaa tgt gat tgc ttt cct ggg tat gac cta cag tca gac cga aag agc | 1796 |
| Glu Cys Asp Cys Phe Pro Gly Tyr Asp Leu Gln Ser Asp Arg Lys Ser |      |
| 470 475 480   |      |
| tgt gca gct tca gga cca cag cca ctt tta ctg ttt gca aat tcc cag | 1844 |
| Cys Ala Ala Ser Gly Pro Gln Pro Leu Leu Leu Phe Ala Asn Ser Gln |      |
| 485 490 495   |      |
| gac atc cga cac atg cat ttt gat gga aca gac tac aaa gtt ctg ctc | 1892 |
| Asp Ile Arg His Met His Phe Asp Gly Thr Asp Tyr Lys Val Leu Leu |      |
| 500 505 510   |      |
| agc cgg cag atg gga atg gtt ttt gcc ttg gat tat gac cct gtg gaa | 1940 |
| Ser Arg Gln Met Gly Met Val Phe Ala Leu Asp Tyr Asp Pro Val Glu |      |
| 515 520 525   |      |
| agc aag ata tat ttt gca cag aca gcc ctg aag tgg ata gag agg gct | 1988 |
| Ser Lys Ile Tyr Phe Ala Gln Thr Ala Leu Lys Trp Ile Glu Arg Ala |      |
| 530 535 540 545   |      |
| aat atg gat ggg tcc cag cga gaa aga ctg atc aca gaa gga gta gat | 2036 |
| Asn Met Asp Gly Ser Gln Arg Glu Arg Leu Ile Thr Glu Gly Val Asp |      |
| 550 555 560   |      |
| acg ctt gaa ggt ctt gcc ctg gac tgg att ggc cgg aga atc tac tgg | 2084 |
| Thr Leu Glu Gly Leu Ala Leu Asp Trp Ile Gly Arg Arg Ile Tyr Trp |      |
| 565 570 575   |      |
| aca gac agt ggg aag tct gtt gtt gga ggg agc gat ctg agc ggg aag | 2132 |
| Thr Asp Ser Gly Lys Ser Val Val Gly Gly Ser Asp Leu Ser Gly Lys |      |
| 580 585 590   |      |
| cat cat cga ata atc atc cag gag aga atc tcg agg ccg cga gga ata | 2180 |
| His His Arg Ile Ile Ile Gln Glu Arg Ile Ser Arg Pro Arg Gly Ile |      |
| 595 600 605   |      |
| gct gtg cat cca agg gcc agg aga ctg ttc tgg acg gac gta ggg atg | 2228 |
| Ala Val His Pro Arg Ala Arg Arg Leu Phe Trp Thr Asp Val Gly Met |      |
| 610 615 620 625   |      |

|   |      |
|---|------|
| tct cca cgg att gaa agc gct tcc ctt caa ggt tcc gac cgg gtg ctg | 2276 |
| Ser Pro Arg Ile Glu Ser Ala Ser Leu Gln Gly Ser Asp Arg Val Leu |      |
| 630 635 640   |      |
| ata gcc agc tcc aat cta ctg gaa ccc agt gga atc acg att gac tac | 2324 |
| Ile Ala Ser Ser Asn Leu Leu Glu Pro Ser Gly Ile Thr Ile Asp Tyr |      |
| 645 650 655   |      |
| tta aca gac act ttg tac tgg tgt gac acc aag agg tct gtg att gaa | 2372 |
| Leu Thr Asp Thr Leu Tyr Trp Cys Asp Thr Lys Arg Ser Val Ile Glu |      |
| 660 665 670   |      |
| atg gcc aat ctg gat ggc tcc aaa cgc cga aga ctt atc cag aac gac | 2420 |
| Met Ala Asn Leu Asp Gly Ser Lys Arg Arg Arg Leu Ile Gln Asn Asp |      |
| 675 680 685   |      |
| gta ggt cac ccc ttc tct cta gcc gtg ttt gag gat cac ctg tgg gtc | 2468 |
| Val Gly His Pro Phe Ser Leu Ala Val Phe Glu Asp His Leu Trp Val |      |
| 690 695 700 705   |      |
| tcg gat tgg gct atc cca tcg gta ata agg gtg aac aag agg act ggc | 2516 |
| Ser Asp Trp Ala Ile Pro Ser Val Ile Arg Val Asn Lys Arg Thr Gly |      |
| 710 715 720   |      |
| caa aac agg gta cgt ctt caa ggc agc atg ctg aag ccc tcg tca ctg | 2564 |
| Gln Asn Arg Val Arg Leu Gln Gly Ser Met Leu Lys Pro Ser Ser Leu |      |
| 725 730 735   |      |
| gtt gtg gtc cat cca ttg gca aaa cca ggt gca gat ccc tgc tta tac | 2612 |
| Val Val Val His Pro Leu Ala Lys Pro Gly Ala Asp Pro Cys Leu Tyr |      |
| 740 745 750   |      |
| agg aat gga ggc tgt gaa cac atc tgc caa gag agc ctg ggc aca gct | 2660 |
| Arg Asn Gly Gly Cys Glu His Ile Cys Gln Glu Ser Leu Gly Thr Ala |      |
| 755 760 765   |      |
| cgg tgt ttg tgt cgt gaa ggt ttt gtg aag gcc tgg gat ggg aaa atg | 2708 |
| Arg Cys Leu Cys Arg Glu Gly Phe Val Lys Ala Trp Asp Gly Lys Met |      |
| 770 775 780 785   |      |
| tgt ctc cct cag gat tat cca atc ctg tca ggt gaa aat gct gat ctt | 2756 |
| Cys Leu Pro Gln Asp Tyr Pro Ile Leu Ser Gly Glu Asn Ala Asp Leu |      |
| 790 795 800   |      |
| agt aaa gag gtg aca tca ctg agc aac tcc act cag gct gaa gta cca | 2804 |
| Ser Lys Glu Val Thr Ser Leu Ser Asn Ser Thr Gln Ala Glu Val Pro |      |
| 805 810 815   |      |
| gac gat gat ggg aca gaa tct tcc aca cta gtg gct gaa atc atg gtg | 2852 |
| Asp Asp Asp Gly Thr Glu Ser Ser Thr Leu Val Ala Glu Ile Met Val |      |
| 820 825 830   |      |
| tca ggc atg aac tat gaa gat gac tgt ggt ccc ggg ggg tgt gga agc | 2900 |
| Ser Gly Met Asn Tyr Glu Asp Asp Cys Gly Pro Gly Gly Cys Gly Ser |      |
| 835 840 845   |      |
| cat gct cga tgc gtt tca gac gga gag act gct gag tgt cag tgt ctg | 2948 |

|      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| His  | Ala | Arg  | Cys  | Val  | Ser  | Asp  | Gly  | Glu  | Thr  | Ala  | Glu  | Cys  | Gln  | Cys  | Leu  |      |
| 850  |     |      |      |      | 855  |      |      |      |      | 860  |      |      |      |      | 865  |      |
| aaa  | ggg | ttt  | gcc  | agg  | gat  | gga  | aac  | ctg  | tgt  | tct  | gat  | ata  | gat  | gag  | tgt  | 2996 |
| Lys  | Gly | Phe  | Ala  | Arg  | Asp  | Gly  | Asn  | Leu  | Cys  | Ser  | Asp  | Ile  | Asp  | Glu  | Cys  |      |
|      |     |      |      | 870  |      |      |      |      | 875  |      |      |      |      | 880  |      |      |
| gtg  | ctg | gct  | aga  | tcg  | gac  | tgc  | ccc  | agc  | acc  | tcg  | tcc  | agg  | tgc  | atc  | aac  | 3044 |
| Val  | Leu | Ala  | Arg  | Ser  | Asp  | Cys  | Pro  | Ser  | Thr  | Ser  | Ser  | Arg  | Cys  | Ile  | Asn  |      |
|      |     |      | 885  |      |      |      |      | 890  |      |      |      |      | 895  |      |      |      |
| act  | gaa | ggt  | ggc  | tac  | gtc  | tgc  | aga  | tgc  | tca  | gaa  | ggc  | tac  | gaa  | gga  | gac  | 3092 |
| Thr  | Glu | Gly  | Gly  | Tyr  | Val  | Cys  | Arg  | Cys  | Ser  | Glu  | Gly  | Tyr  | Glu  | Gly  | Asp  |      |
|      |     | 900  |      |      |      |      | 905  |      |      |      |      | 910  |      |      |      |      |
| ggg  | atc | tcc  | tgt  | ttc  | gat  | att  | gac  | gag  | tgc  | cag  | cgg  | ggg  | gcg  | cac  | aac  | 3140 |
| Gly  | Ile | Ser  | Cys  | Phe  | Asp  | Ile  | Asp  | Glu  | Cys  | Gln  | Arg  | Gly  | Ala  | His  | Asn  |      |
|      | 915 |      |      |      |      | 920  |      |      |      |      | 925  |      |      |      |      |      |
| tgc  | gct | gag  | aat  | gcc  | gcc  | tgc  | acc  | aac  | acg  | gag  | gga  | ggc  | tac  | aac  | tgc  | 3188 |
| Cys  | Ala | Glu  | Asn  | Ala  | Ala  | Cys  | Thr  | Asn  | Thr  | Glu  | Gly  | Gly  | Tyr  | Asn  | Cys  |      |
| 930  |     |      |      |      | 935  |      |      |      |      | 940  |      |      |      |      | 945  |      |
| acc  | tgc | gca  | ggc  | cgc  | cca  | tcc  | tcg  | ccc  | gga  | cgg  | agt  | tgc  | cct  | gac  | tct  | 3236 |
| Thr  | Cys | Ala  | Gly  | Arg  | Pro  | Ser  | Ser  | Pro  | Gly  | Arg  | Ser  | Cys  | Pro  | Asp  | Ser  |      |
|      |     |      |      | 950  |      |      |      |      | 955  |      |      |      |      | 960  |      |      |
| acc  | gca | ccc  | tct  | ctc  | ctt  | ggg  | gaa  | gat  | ggc  | cac  | cat  | ttg  | gac  | cga  | aat  | 3284 |
| Thr  | Ala | Pro  | Ser  | Leu  | Leu  | Gly  | Glu  | Asp  | Gly  | His  | His  | Leu  | Asp  | Arg  | Asn  |      |
|      |     |      | 965  |      |      |      |      | 970  |      |      |      |      | 975  |      |      |      |
| agt  | tat | cca  | gga  | tgc  | cca  | tcc  | tca  | tat  | gat  | gga  | tac  | tgc  | ctc  | aat  | ggt  | 3332 |
| Ser  | Tyr | Pro  | Gly  | Cys  | Pro  | Ser  | Ser  | Tyr  | Asp  | Gly  | Tyr  | Cys  | Leu  | Asn  | Gly  |      |
|      |     | 980  |      |      |      |      | 985  |      |      |      |      | 990  |      |      |      |      |
| ggc  | gtg | tgc  | atg  | cat  | att  | gaa  | tca  | ctg  | gac  | agc  | tac  | aca  | tgc  | aac  | tgt  | 3380 |
| Gly  | Val | Cys  | Met  | His  | Ile  | Glu  | Ser  | Leu  | Asp  | Ser  | Tyr  | Thr  | Cys  | Asn  | Cys  |      |
|      | 995 |      |      |      |      | 1000 |      |      |      |      | 1005 |      |      |      |      |      |
| gtt  | att | ggc  | tat  | tct  | ggg  | gat  | cga  | tgt  | cag  | act  | cga  | gac  | cta  | cga  | tgg  | 3428 |
| Val  | Ile | Gly  | Tyr  | Ser  | Gly  | Asp  | Arg  | Cys  | Gln  | Thr  | Arg  | Asp  | Leu  | Arg  | Trp  |      |
| 1010 |     |      |      |      | 1015 |      |      |      |      | 1020 |      |      |      |      | 1025 |      |
| tgg  | gag | ctg  | cgt  | cat  | gct  | ggc  | tac  | ggg  | cag  | aag  | cat  | gac  | atc  | atg  | gtg  | 3476 |
| Trp  | Glu | Leu  | Arg  | His  | Ala  | Gly  | Tyr  | Gly  | Gln  | Lys  | His  | Asp  | Ile  | Met  | Val  |      |
|      |     |      |      | 1030 |      |      |      |      | 1035 |      |      |      |      | 1040 |      |      |
| gtg  | gct | gtc  | tgc  | atg  | gtg  | gca  | ctg  | gtc  | ctg  | ctg  | ctc  | ctc  | ttg  | ggg  | atg  | 3524 |
| Val  | Ala | Val  | Cys  | Met  | Val  | Ala  | Leu  | Val  | Leu  | Leu  | Leu  | Leu  | Leu  | Gly  | Met  |      |
|      |     |      | 1045 |      |      |      |      | 1050 |      |      |      |      | 1055 |      |      |      |
| tgg  | ggg | act  | tac  | tac  | tac  | agg  | act  | cgg  | aag  | cag  | cta  | tca  | aac  | ccc  | cca  | 3572 |
| Trp  | Gly | Thr  | Tyr  | Tyr  | Tyr  | Arg  | Thr  | Arg  | Lys  | Gln  | Leu  | Ser  | Asn  | Pro  | Pro  |      |
|      |     | 1060 |      |      |      |      | 1065 |      |      |      |      | 1070 |      |      |      |      |
| aag  | aac | cct  | tgt  | gat  | gag  | cca  | agc  | gga  | agt  | gtg  | agc  | agc  | agc  | ggg  | ccc  | 3620 |
| Lys  | Asn | Pro  | Cys  | Asp  | Glu  | Pro  | Ser  | Gly  | Ser  | Val  | Ser  | Ser  | Ser  | Gly  | Pro  |      |

| 1075  | 1080 | 1085 |      |
|---|------|------|------|
| gac agc agc agc ggg gca gct gtg gct tct tgt ccc caa cct tgg ttt     |      |      | 3668 |
| Asp Ser Ser Ser Gly Ala Ala Val Ala Ser Cys Pro Gln Pro Trp Phe     |      |      |      |
| 1090  | 1095 | 1100 | 1105 |
| gtg gtc cta gag aaa cac caa gac ccc aag aat ggg agt ctg cct gcg     |      |      | 3716 |
| Val Val Leu Glu Lys His Gln Asp Pro Lys Asn Gly Ser Leu Pro Ala     |      |      |      |
|   | 1110 | 1115 | 1120 |
| gat ggt acg aat ggt gca gta gta gat gct ggc ctg tct ccc tcc ctg     |      |      | 3764 |
| Asp Gly Thr Asn Gly Ala Val Val Asp Ala Gly Leu Ser Pro Ser Leu     |      |      |      |
|   | 1125 | 1130 | 1135 |
| cag ctc ggg tca gtg cat ctg act tca tgg aga cag aag ccc cac ata     |      |      | 3812 |
| Gln Leu Gly Ser Val His Leu Thr Ser Trp Arg Gln Lys Pro His Ile     |      |      |      |
|   | 1140 | 1145 | 1150 |
| gat gga atg ggc aca ggg caa agc tgc tgg att cca cca tca agt gac     |      |      | 3860 |
| Asp Gly Met Gly Thr Gly Gln Ser Cys Trp Ile Pro Pro Ser Ser Asp     |      |      |      |
|   | 1155 | 1160 | 1165 |
| aga gga ccc cag gaa ata gag gga aac tcc cac cta ccc tcc tac aga     |      |      | 3908 |
| Arg Gly Pro Gln Glu Ile Glu Gly Asn Ser His Leu Pro Ser Tyr Arg     |      |      |      |
|   | 1170 | 1175 | 1180 |
| cct gtg ggg ccg gag aag ctg cat tct ctc cag tca gct aat gga tgc     |      |      | 3956 |
| Pro Val Gly Pro Glu Lys Leu His Ser Leu Gln Ser Ala Asn Gly Ser     |      |      |      |
|   | 1190 | 1195 | 1200 |
| tgt cac gaa agg gct cca gac ctg cca cgg cag aca gag cca gtt aag     |      |      | 4004 |
| Cys His Glu Arg Ala Pro Asp Leu Pro Arg Gln Thr Glu Pro Val Lys     |      |      |      |
|   | 1205 | 1210 | 1215 |
| tag aaactgggag tagacagaag gtacagaagg gaaaataaca aaccaggctg          |      |      | 4057 |
|   |      |      |      |
| atgatggtag agtgctacag acttgggtact ccagtttcca cggctaataca ctgctcgctc |      |      | 4117 |
| agggtcctga agatagctgc acagctgcag agctgcacag cgggatatgct gcgacttttg  |      |      | 4177 |
| cttcttgctt taagcagttc cactgaagat actcaaaaga gaagtggaga aaatcattag   |      |      | 4237 |
| aaaccaaagt caagacattc atatataagc tgtgtcttct tcaactggacg gtttgccctc  |      |      | 4297 |
| tttccttttg cctcagaagg agtgggttaa agcaggtgac cccatgctct gtcaaccct    |      |      | 4357 |
| gaataaatga tgtgatctac atagaagtct tagctcactc tcaggaacgc ttggaacact   |      |      | 4417 |
| ataacttttg ctatgatata ctgccaagtg tggcccatgc tcataattgt gccttctgaa   |      |      | 4477 |
| ttgtgataaa ttagtgaaaa aactgtaact tagaatctga ttatttcagg attagatcat   |      |      | 4537 |
| ctttttatac tataaaaaatc ttcgaatgaa aatatttaac tttaaaaaaca ttaccttaat |      |      | 4597 |
| cattgtcttt tcttcttgaa gtctttccca gtgaaaacgc tcaattctgc tgtttccata   |      |      | 4657 |



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4749

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<220>

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<400> 28

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Met | Pro | Trp | Gly | Arg | Arg | Pro | Thr | Trp | Leu | Leu | Leu | Ala | Phe | Leu | Leu |  |  |
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|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |  |  |
| Ala | Gly | Pro | Ala | Pro | Phe | Leu | Val | Phe | Ser | Gln | Gly | Lys | Ser | Ile | Ser |  |  |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |  |  |
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|     | 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |  |  |
| Gly | Ile | Ser | Ala | Asp | Met | Asp | Ile | His | Tyr | Lys | Lys | Glu | Arg | Leu | Tyr |  |  |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |  |  |
| Trp | Val | Asp | Val | Glu | Arg | Gln | Val | Leu | Leu | Arg | Val | Phe | Leu | Asn | Gly |  |  |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     |     | 110 |     |  |  |
| Thr | Gly | Leu | Glu | Lys | Val | Cys | Asn | Val | Glu | Arg | Lys | Val | Ser | Gly | Leu |  |  |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     |     |     | 125 |     |  |  |
| Ala | Ile | Asp | Trp | Ile | Asp | Asp | Glu | Val | Leu | Trp | Val | Asp | Gln | Gln | Asn |  |  |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |  |  |
| Gly | Val | Ile | Thr | Val | Thr | Asp | Met | Thr | Gly | Lys | Asn | Ser | Arg | Val | Leu |  |  |
|     | 145 |     |     |     |     | 150 |     |     |     | 155 |     |     |     |     | 160 |  |  |
| Leu | Ser | Ser | Leu | Lys | His | Pro | Ser | Asn | Ile | Ala | Val | Asp | Pro | Ile | Glu |  |  |
|     |     |     |     | 165 |     |     |     | 170 |     |     |     |     |     | 175 |     |  |  |
| Arg | Leu | Met | Phe | Trp | Ser | Ser | Glu | Val | Thr | Gly | Ser | Leu | His | Arg | Ala |  |  |
|     |     | 180 |     |     |     |     | 185 |     |     |     |     |     |     | 190 |     |  |  |
| His | Leu | Lys | Gly | Val | Asp | Val | Lys | Thr | Leu | Leu | Glu | Thr | Gly | Gly | Ile |  |  |
|     | 195 |     |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |  |  |
| Ser | Val | Leu | Thr | Leu | Asp | Val | Leu | Asp | Lys | Arg | Leu | Phe | Trp | Val | Gln |  |  |
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| Asp | Ser | Gly | Glu | Gly | Ser | His | Ala | Tyr | Ile | His | Ser | Cys | Asp | Tyr | Glu |  |  |
|     | 225 |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |  |
| Gly | Gly | Ser | Val | Arg | Leu | Ile | Arg | His | Gln | Ala | Arg | His | Ser | Leu | Ser |  |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |  |  |
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|     |     | 260 |     |     |     |     | 265 |     |     |     |     |     | 270 |     |     |  |  |
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90

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|      |      | 835  |      |      |      |      | 840  |      |      |      |      | 845  |      |      |      |
| Ser  | His  | Ala  | Arg  | Cys  | Val  | Ser  | Asp  | Gly  | Glu  | Thr  | Ala  | Glu  | Cys  | Gln  | Cys  |
|      | 850  |      |      |      |      | 855  |      |      |      |      | 860  |      |      |      |      |
| Leu  | Lys  | Gly  | Phe  | Ala  | Arg  | Asp  | Gly  | Asn  | Leu  | Cys  | Ser  | Asp  | Ile  | Asp  | Glu  |
| 865  |      |      |      |      | 870  |      |      |      | 875  |      |      |      |      |      | 880  |
| Cys  | Val  | Leu  | Ala  | Arg  | Ser  | Asp  | Cys  | Pro  | Ser  | Thr  | Ser  | Ser  | Arg  | Cys  | Ile  |
|      |      |      | 885  |      |      |      |      | 890  |      |      |      |      |      | 895  |      |
| Asn  | Thr  | Glu  | Gly  | Gly  | Tyr  | Val  | Cys  | Arg  | Cys  | Ser  | Glu  | Gly  | Tyr  | Glu  | Gly  |
|      |      | 900  |      |      |      |      | 905  |      |      |      |      |      | 910  |      |      |
| Asp  | Gly  | Ile  | Ser  | Cys  | Phe  | Asp  | Ile  | Asp  | Glu  | Cys  | Gln  | Arg  | Gly  | Ala  | His  |
|      | 915  |      |      |      |      | 920  |      |      |      |      |      | 925  |      |      |      |
| Asn  | Cys  | Ala  | Glu  | Asn  | Ala  | Ala  | Cys  | Thr  | Asn  | Thr  | Glu  | Gly  | Gly  | Tyr  | Asn  |
|      | 930  |      |      |      | 935  |      |      |      |      |      | 940  |      |      |      |      |
| Cys  | Thr  | Cys  | Ala  | Gly  | Arg  | Pro  | Ser  | Ser  | Pro  | Gly  | Arg  | Ser  | Cys  | Pro  | Asp  |
| 945  |      |      |      |      | 950  |      |      |      | 955  |      |      |      |      |      | 960  |
| Ser  | Thr  | Ala  | Pro  | Ser  | Leu  | Leu  | Gly  | Glu  | Asp  | Gly  | His  | His  | Leu  | Asp  | Arg  |
|      |      |      | 965  |      |      |      |      | 970  |      |      |      |      |      | 975  |      |
| Asn  | Ser  | Tyr  | Pro  | Gly  | Cys  | Pro  | Ser  | Ser  | Tyr  | Asp  | Gly  | Tyr  | Cys  | Leu  | Asn  |
|      |      | 980  |      |      |      |      | 985  |      |      |      |      |      | 990  |      |      |
| Gly  | Gly  | Val  | Cys  | Met  | His  | Ile  | Glu  | Ser  | Leu  | Asp  | Ser  | Tyr  | Thr  | Cys  | Asn  |
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|      | 1010 |      |      |      | 1015 |      |      |      |      | 1020 |      |      |      |      |      |
| Trp  | Trp  | Glu  | Leu  | Arg  | His  | Ala  | Gly  | Tyr  | Gly  | Gln  | Lys  | His  | Asp  | Ile  | Met  |
| 1025 |      |      |      | 1030 |      |      |      |      | 1035 |      |      |      |      |      | 1040 |
| Val  | Val  | Ala  | Val  | Cys  | Met  | Val  | Ala  | Leu  | Val  | Leu  | Leu  | Leu  | Leu  | Leu  | Gly  |
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|      |      | 1060 |      |      |      |      | 1065 |      |      |      |      | 1070 |      |      |      |
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| Pro  | Asp  | Ser  | Ser  | Ser  | Gly  | Ala  | Ala  | Val  | Ala  | Ser  | Cys  | Pro  | Gln  | Pro  | Trp  |
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| Leu  | Gln  | Leu  | Gly  | Ser  | Val  | His  | Leu  | Thr  | Ser  | Trp  | Arg  | Gln  | Lys  | Pro  | His  |
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|      | 1155 |      |      |      |      | 1160 |      |      |      |      | 1165 |      |      |      |      |
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<400> 32

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| Met | Val | Pro | Ala | Thr | Gly | Gln | Leu | Ala | Leu | Leu | Ala | Leu | Gly | Ile | Leu |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |
| Leu | Ala | Val | Cys | Gln | Ala | Leu | Glu | Asn | Ser | Thr | Ser | Pro | Leu | Ser | Asp |
|     |     | 20  |     |     |     | 25  |     |     |     |     |     | 30  |     |     |     |
| Ser | Pro | Val | Ala | Ala | Ala | Val | Val | Ser | His | Phe | Asn | Lys | Cys | Pro | Asp |
|     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |     |
| Ser | His | Thr | Gln | Tyr | Cys | Phe | His | Gly | Thr | Cys | Arg | Phe | Leu | Val | Gln |
|     | 50  |     |     |     | 55  |     |     | 60  |     |     |     |     |     |     |     |
| Glu | Glu | Lys | Pro | Ala | Cys | Val | Cys | His | Ser | Gly | Tyr | Val | Gly | Val | Arg |
| 65  |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |     |

Cys Glu His Ala Asp Leu Leu Ala Val Val Ala Ala Ser Gln Lys Lys  
                             85                            90                            95  
 Gln Ala Ile Thr Ala Leu Val Val Val Ser Ile Val Ala Leu Ala Val  
                             100                            105                            110  
 Leu Ile Ile Thr Cys Val Leu Ile His Cys Cys Gln Leu Arg Lys His  
                             115                            120                            125  
 Cys Glu Trp Cys Arg Ala Leu Val Cys Arg His Glu Lys Pro Ser Ala  
                             130                            135                            140  
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Lys Asn Asp Phe Ala Gly Leu Lys Gln Leu Arg Val Leu Gln Leu Met  
                             20                            25                            30

Glu Asn Gln Ile Gly Ala Val Glu Arg Gly Ala Phe Asp Asp Met Lys  
                             35                            40                            45

Glu Leu Glu Arg Leu Arg Leu Asn Arg Asn Gln Leu His Met Leu Pro  
                             50                            55                            60

Glu Leu Leu Phe Gln Asn Asn Gln Ala Leu Ser Arg Leu Asp Leu Ser  
 65                            70                            75                            80

Glu Asn Ala Ile Gln Ala Ile Pro Arg Lys Ala Phe Arg Gly Ala Thr  
                             85                            90                            95

Asp Leu Lys Asn Leu Arg Leu Asp Lys Asn Gln Ile Ser Cys Ile Glu  
                             100                            105                            110

Glu Gly Ala Phe Arg Ala Leu Arg Gly Leu Glu Val Leu Thr Leu Asn  
                             115                            120                            125

Asn Asn Asn Ile Thr Thr Ile Pro Val Ser Ser Phe Asn His Met Pro  
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Thr Met Thr Glu Ile Arg Leu Glu Leu Asn Gly Ile Lys Ser Ile Pro  
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Pro Gly Ala Phe Ser Pro Tyr Arg Lys Leu Arg Arg Ile Asp Leu Ser  
 20 25 30

Asn Asn Gln Ile Ala Glu Ile Ala Pro Asp Ala Phe Gln Gly Leu Arg  
 35 40 45

Ser Leu Asn Ser Leu Val Leu Tyr Gly Asn Lys Ile Thr Asp Leu Pro  
 50 55 60

Arg Gly Val Phe Gly Gly Leu Tyr Thr Leu Gln Leu Leu Leu Leu Asn  
 65 70 75 80

Ala Asn Lys Ile Asn Cys Ile Arg Pro Asp Ala Phe Gln Asp Leu Gln  
 85 90 95

Asn Leu Ser Leu Leu Ser Leu Tyr Asp Asn Lys Ile Gln Ser Leu Ala  
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Lys Gly Thr Phe Thr Ser Leu Arg  
 115 120

<210> 35  
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 <223> Mammalian Slit1\_LRRs3 amino acid sequence from Fig.11

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His Leu Lys Lys Ile Asn Leu Ser Asn Asn Lys Val Ser Glu Ile Glu

|   |                     |                                 |    |
|---|---------------------|---------------------------------|----|
| 1   | 5                   | 10                              | 15 |
| Asp Gly Ala   | Phe Glu Gly Ala Ala | Ser Val Ser Glu Leu His Leu Thr |    |
|   | 20                  | 25                              | 30 |
| Ala Asn Gln Leu Glu Ser Ile Arg Ser Gly Met Phe Arg Gly Leu Asp |                     |                                 |    |
|   | 35                  | 40                              | 45 |
| Gly Leu Arg Thr Leu Met Leu Arg Asn Asn Arg Ile Ser Cys Ile His |                     |                                 |    |
|   | 50                  | 55                              | 60 |
| Asn Asp Ser Phe Thr Gly Leu Arg Asn Val Arg Leu Leu Ser Leu Tyr |                     |                                 |    |
|   | 65                  | 70                              | 75 |
| Asp Asn Gln Ile Thr Thr Val Ser Pro Gly Ala Phe Asp Thr Leu Gln |                     |                                 |    |
|   | 85                  | 90                              | 95 |
| <210> 36  |                     |                                 |    |
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| Tyr Leu Gln Leu Val Asp Leu Ser Asn Asn Lys Ile Ser Ser Leu Ser |                     |                                 |    |
| 1   | 5                   | 10                              | 15 |
| Asn Ser Ser Phe Thr Asn Met Ser Gln Leu Thr Thr Leu Ile Leu Ser |                     |                                 |    |
|   | 20                  | 25                              | 30 |
| Tyr Asn Ala Leu Gln Cys Ile Pro Pro Leu Ala Phe Gln Gly Leu Arg |                     |                                 |    |
|   | 35                  | 40                              | 45 |
| Ser Leu Arg Leu Leu Ser Leu His Gly Asn Asp Ile Ser Thr Leu Gln |                     |                                 |    |
|   | 50                  | 55                              | 60 |
| Glu Gly Ile Phe Ala Asp Val Thr                                 |                     |                                 |    |
|   | 65                  | 70                              |    |
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Asp Pro Ala Thr Phe His Gly Leu Gly Arg Leu His Thr Leu His Leu  
20 25 30

Asp Arg Cys Gly Leu Gln Glu Leu Gly Pro Gly Leu Phe Arg Gly Leu  
35 40 45

Ala Ala Leu Gln Tyr Leu Tyr Leu Gln Asp Asn Ala Leu Gln Ala Leu  
50 55 60

Pro Asp Asp Thr Phe Arg Asp Leu Gly Asn Leu Thr His Leu Phe Leu  
65 70 75 80

His Gly Asn Arg Ile Ser Ser Val Pro Glu Arg Ala Phe Arg Gly Leu  
85 90 95

His Ser Leu Asp Arg Leu Leu Leu His Gln Asn Arg Val Ala His Val  
100 105 110

His Pro His Ala Phe Arg Asp Leu Gly Arg Leu Met Thr Leu Tyr Leu  
115 120 125

Phe Ala Asn Asn Leu Ser Ala Leu Pro Thr Glu Ala Leu Ala Pro Leu  
130 135 140

Arg  
145

<210> 38

<211> 148

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<213> Homo sapiens

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<223> AMIGO amino acid sequence from Fig.11

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Ala Glu Trp Thr Pro Thr Arg Leu Thr Gln Leu His Ser Leu Leu Leu  
 20 25 30

Ser His Asn His Leu Asn Phe Ile Ser Ser Glu Ala Phe Ser Pro Val  
 35 40 45

Pro Asn Leu Arg Tyr Leu Asp Leu Ser Ser Asn Gln Leu Arg Thr Leu  
 50 55 60

Asp Glu Phe Leu Phe Ser Asp Leu Gln Val Leu Glu Val Leu Leu Leu  
 65 70 75 80

Tyr Asn Asn His Ile Met Ala Val Asp Arg Cys Ala Phe Asp Asp Met  
 85 90 95

Ala Gln Leu Gln Lys Leu Tyr Leu Ser Gln Asn Gln Ile Ser Arg Phe  
 100 105 110

Pro Leu Glu Leu Val Lys Glu Gly Ala Lys Leu Pro Lys Leu Thr Leu  
 115 120 125

Leu Asp Leu Ser Ser Asn Lys Leu Lys Asn Leu Pro Leu Pro Asp Leu  
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Gln Lys Leu Pro  
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Xaa Xaa Xaa Phe Xaa Xaa Leu Xaa Xaa Leu Xaa Xaa Leu Xaa Leu Xaa  
20 25 30

Xaa Asn Xaa Leu Xaa Xaa Xaa Xaa Xaa Xaa Xaa Phe Xaa Xaa Leu Xaa  
35 40 45

Xaa Leu Xaa Xaa Leu Xaa Leu Xaa Xaa Asn Xaa Leu Xaa Xaa Xaa Xaa

|   |     |    |     |     |
|---|-----|----|-----|-----|
| 50  |     | 55 |     | 60  |
| Xaa Xaa Phe Xaa Xaa Leu Xaa Xaa Leu Xaa Xaa Leu Xaa Leu Xaa Xaa |     |    |     |     |
| 65  |     | 70 |     | 75  |
|   |     |    |     | 80  |
| Asn Xaa Leu Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Phe Xaa Xaa Leu Xaa |     |    |     |     |
|   | 85  |    | 90  | 95  |
| Xaa Leu Xaa Xaa Leu Xaa Leu Xaa Xaa Asn Xaa Leu Xaa Xaa Xaa Xaa |     |    |     |     |
|   | 100 |    | 105 | 110 |
| Xaa Xaa Xaa Phe Xaa Xaa Leu Xaa Xaa Leu Xaa Xaa Leu Xaa Leu Xaa |     |    |     |     |
|   | 115 |    | 120 | 125 |
| Xaa Asn Xaa Leu Xaa Xaa Xaa Xaa Xaa Xaa Xaa Phe Xaa Xaa Leu Xaa |     |    |     |     |
|   | 130 |    | 135 | 140 |

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| Xaa | Leu | Glu | Xaa | Leu | Xaa | Leu | Xaa | Xaa | Cys | Xaa | Leu | Thr | Xaa | Xaa | Xaa |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     |     | 15  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Xaa | Xaa | Leu | Xaa | Xaa | Xaa | Leu | Xaa | Xaa | Xaa | Xaa |
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<210> 46  
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| aacctcccca tcagcctacg ctg  | 23 |
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| <211> 23                   |    |
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| tgtttatattt gcagaccaca cac | 23 |
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| ctcagaggcg accataatgt c    | 21 |
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| <211> | 20                      |    |
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|       | ggcactttag ctccgtgatg   | 20 |
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| <211> | 20                      |    |
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Tyr Ala Met Gly Glu Thr Phe Asn Glu Thr  
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 <210> 78  
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<400> 79

Leu Xaa Xaa Leu Xaa Leu Xaa Xaa Asn Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
 1 5 10 15

Xaa Xaa Xaa